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GLOBAL DATA MONITORING REPORT

March, 1998

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis. The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1-2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At RSMC Bracknell, for synoptic stations at or below a height of 500 metres, reported mean sea-level pressure is used in the statistics. If this is unavailable the mean sea-level pressure is calculated from the reported station-level pressure and temperature.

For synoptic stations above 500 metres, the mean sea-level pressure is calculated from the reported station-level pressure and temperature, or, if these are not available the height of a standard pressure-level (e.g.: 850 hPa or 700 hPa). If neither of these are available, the reported mean sea-level pressure is used.

Some stations vary their reporting practice according to the observation hour (e.g.: some stations in the CIS report both mean sea-level and station-level pressure at 00 & 12 UTC, but only mean sea-level pressure at 06 & 18 UTC). For monitoring purposes, reported mean sea-level pressure is stored separately from that calculated from station-level pressure or height of a standard pressure-level. Only statistics for the preferred method (see above) are presented in this report, and so for certain high-level stations, such as those from the CIS, approximately half of the number of observations actually received will appear in the statistics.

Aircraft observations

TABLE 4 contains a list of statistics calculated from data received from all airline carriers.

Figure 3 shows 10 degree lat/long box average numbers of aircraft reports (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) received per day throughout the month at Bracknell and assimilated into model runs in the layer 70-500 hPa. Observations with a vector wind difference (compared with the model background field) of >60 $m\ s^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4-7 show wind statistics for AIREP/ASDAR (in AIREP/AMDAR code, including AIREPs, ACARs, AMDARs and ASDARs) in the layer 70-500 hPa. Observations with a vector wind difference > 60 $m\ s^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed ($m\ s^{-1}$)
7	RMS observation-background vector ($m\ s^{-1}$)

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-27 show satellite mean observation-background temperature differences for NOAA-11 soundings at 500 km resolution and figures 28-30 show the same statistics for NOAA-14. Data are plotted where there are > 30 observations in a 10 degree lat/long box.

N.B. 500 km SATEMs are no longer assimilated into the UKMO global Unified Model. Both 500 km and 120 km SATEMs were replaced on 16th April 1996 by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS (from NOAA-11 and NOAA-14).

Figure	Layer (hPa)
25/28	850-1000
26/29	100-300
27/30	30-50

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

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Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
6. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for ships, fixed buoys and platforms.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees).
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind)		
SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
C6FA6	ALL	P	SUR	35	0	0	1.0	-6.0	6.1
C6HQ03	ALL	P	SUR	30	0	0	1.8	-6.2	6.5
DUWH	ALL	P	SUR	88	1	1	1.3	-4.3	4.5
ELNW7	ALL	P	SUR	32	18	56	1.3	-3.1	3.4
ELTE6	ALL	P	SUR	35	0	0	2.0	-5.2	5.6
ELTQ9	ALL	P	SUR	25	11	44	3.1	7.9	8.5
MWZD2	ALL	P	SUR	31	0	0	2.3	5.6	6.0
UAMY	ALL	P	SUR	33	19	58	4.3	-4.8	6.5
UVNY	ALL	P	SUR	25	0	0	2.5	8.8	9.2
V2XO	ALL	P	SUR	45	0	0	1.8	-6.6	6.9
V7AS7	ALL	P	SUR	22	0	0	1.3	12.4	12.4
WDZB	ALL	P	SUR	51	1	2	1.5	-4.8	5.1
WXBZ	ALL	P	SUR	20	0	0	3.1	-5.0	5.9
3BIY	ALL	P	SUR	20	5	25	2.3	-3.3	4.0
3FDY6	ALL	P	SUR	22	0	0	1.5	6.5	6.7
3FGN3	ALL	P	SUR	26	1	4	1.9	-6.2	6.5
9VIH	ALL	P	SUR	25	0	0	1.3	-6.2	6.3
9VPK	ALL	P	SUR	27	2	7	1.2	8.5	8.6
9WCR3	ALL	P	SUR	53	1	2	4.1	-4.3	5.9
WIND SPEED									
BBXX	ALL	SPEED	SUR	48	0	0	2.7	-5.2	5.9
C6JD4	ALL	SPEED	SUR	20	0	0	1.7	-5.4	5.6
C6JV4	ALL	SPEED	SUR	20	0	0	2.8	5.4	6.1
DUXW	ALL	SPEED	SUR	28	2	7	5.8	8.8	10.6
ELQX8	ALL	SPEED	SUR	26	9	35	5.0	15.5	16.3
ELUO7	ALL	SPEED	SUR	38	0	0	4.6	5.3	7.1
J8JW7	ALL	SPEED	SUR	22	0	0	7.5	7.3	10.4
LACG4	ALL	SPEED	SUR	61	1	2	5.7	8.7	10.4
LADN4	ALL	SPEED	SUR	38	0	0	2.0	6.1	6.4
LAZK4	ALL	SPEED	SUR	23	1	4	3.7	14.9	15.3
MXPR2	ALL	SPEED	SUR	26	1	4	8.4	8.9	12.3
OUSE6	ALL	SPEED	SUR	53	0	0	4.2	5.1	6.6
OYCZ	ALL	SPEED	SUR	52	7	13	8.3	8.7	12.1
OZIA	ALL	SPEED	SUR	28	0	0	3.1	5.5	6.3
PDGS	ALL	SPEED	SUR	38	0	0	4.6	5.8	7.5
VOCZ	ALL	SPEED	SUR	20	0	0	3.8	5.3	6.5
VROB	ALL	SPEED	SUR	78	1	1	8.4	8.6	12.0
VRUU3	ALL	SPEED	SUR	26	0	0	6.3	7.0	9.4
VRUZ203	ALL	SPEED	SUR	25	0	0	3.8	7.0	8.0
XYKX	ALL	SPEED	SUR	20	0	0	2.0	7.4	7.6
3BIY	ALL	SPEED	SUR	23	0	0	4.9	5.9	7.7
3EMJ6	ALL	SPEED	SUR	55	1	2	3.5	6.5	7.4
3ETH4	ALL	SPEED	SUR	27	0	0	3.6	7.7	8.5
3FLU7	ALL	SPEED	SUR	42	2	5	5.8	5.4	7.9
9HNV3	ALL	SPEED	SUR	31	0	0	5.8	6.1	8.4
9VIH	ALL	SPEED	SUR	29	0	0	3.4	5.9	6.8
9WCR3	ALL	SPEED	SUR	59	1	2	3.7	5.1	6.3
WIND SPEED									
YJQA8	ALL	DIRN.	SUR	26	0	0	54.2	-30.9	62.4
3FRO4	ALL	DIRN.	SUR	30	0	0	43.2	38.2	57.7
46060	ALL	DIRN.	SUR	419	0	0	18.8	-32.1	37.2
51015	ALL	DIRN.	SUR	72	0	0	14.0	-39.0	41.4
62107	ALL	DIRN.	SUR	455	64	14	98.9	-18.6	100.6
63104	ALL	DIRN.	SUR	480	29	6	108.7	35.5	114.4
63112	ALL	DIRN.	SUR	32	1	3	91.1	29.5	95.7

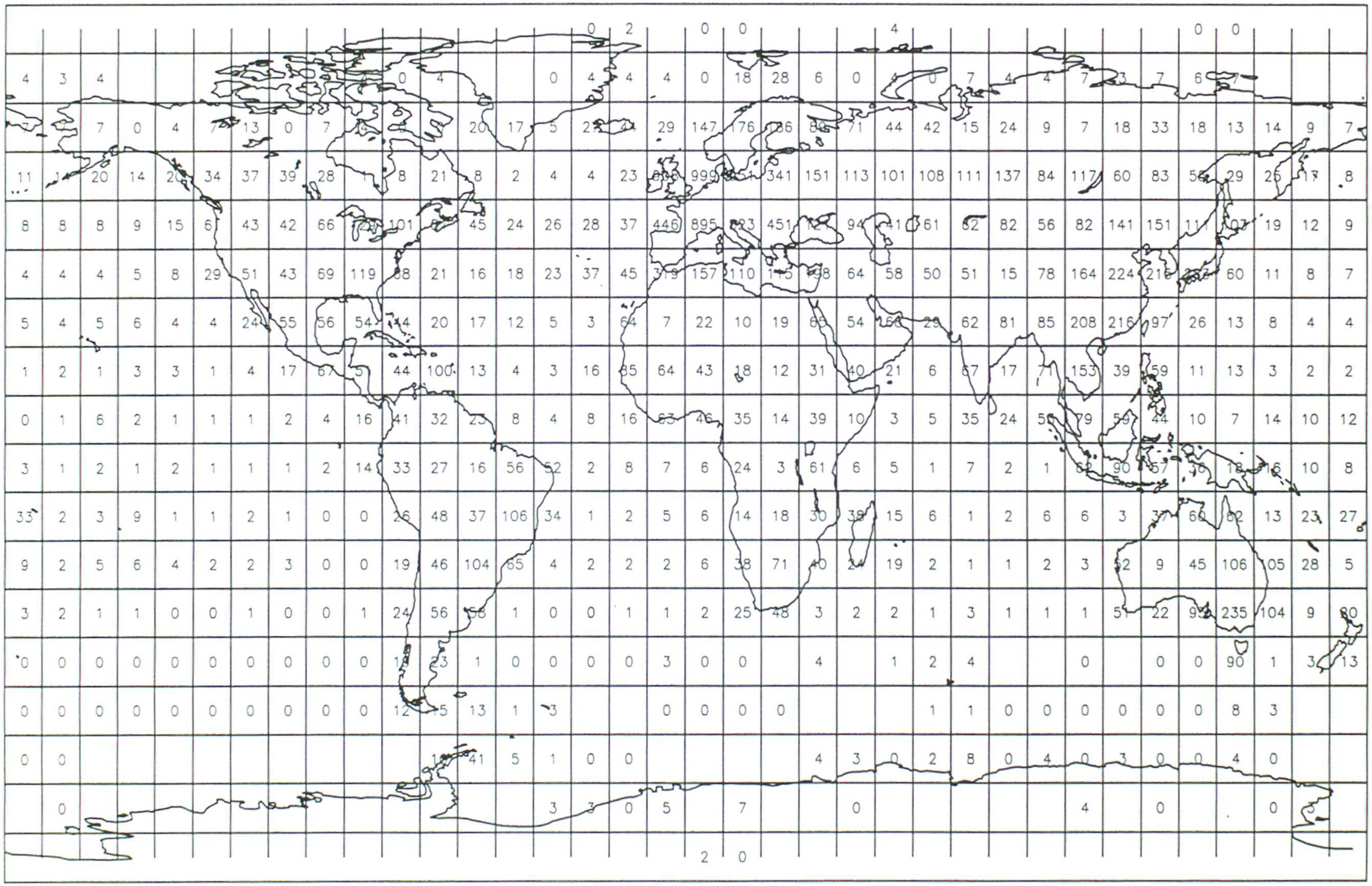
AVAILABILITY – SHIP/SYNOP – MARCH 1998

FIGURE 1

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 20110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11 14 20 14 20 34 37 39 28 1 8 21 8 2 4 4 23 999 341 151 113 101 108 111 137 84 117 60 83 56 29 25 17 8
8 8 8 9 15 6 43 42 66 101 45 24 26 28 37 446 895 823 451 94 41 61 62 82 56 82 141 151 11 107 19 12 9
4 4 4 5 8 29 51 43 69 119 88 21 16 18 23 37 45 319 157 110 115 98 64 58 50 51 15 78 164 224 216 60 11 8 7
5 4 5 6 4 4 24 55 56 54 44 20 17 12 5 3 64 7 22 10 19 65 54 168 29 62 81 85 208 216 97 26 13 8 4 4
1 2 1 3 3 1 4 17 67 5 44 100 13 4 3 16 85 64 43 18 12 31 40 21 6 67 17 71 153 39 59 11 13 3 2 2
0 1 6 2 1 1 1 2 4 16 41 32 23 8 4 8 16 63 46 35 14 39 10 3 5 35 24 56 79 59 44 10 7 14 10 12
3 1 2 1 2 1 1 1 2 14 33 27 16 56 52 2 8 7 6 24 3 61 6 5 1 7 2 1 62 90 57 36 18 16 10 8
33 2 3 9 1 1 2 1 0 0 26 48 37 106 34 1 2 5 6 14 18 30 38 15 6 1 2 6 6 3 37 60 62 13 23 27
9 2 5 6 4 2 2 3 0 0 19 46 104 65 4 2 2 2 6 38 71 40 24 19 2 1 1 2 3 52 9 45 106 105 28 5
3 2 1 1 0 0 1 0 0 1 24 56 58 1 0 0 1 1 2 25 48 3 2 2 1 3 1 1 1 51 22 93 235 104 9 80
0 0 0 0 0 0 0 0 0 0 18 23 1 0 0 0 0 3 0 0 4 1 2 4 0 0 0 90 1 3 13
0 0 0 0 0 0 0 0 0 0 12 15 13 1 3 0 0 0 0 1 1 0 0 0 0 0 0 8 3
0 0 18 41 5 1 0 0 4 3 0 2 8 0 4 0 3 0 0 4 0
0 3 3 0 5 7 0 4 0 0
2 0

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.	
Data monitored		:Reports from each unique identifier for drifting buoys.	
Standard of comparison		:Background field from Bracknell global model.	
Position		:Average latitude and longitude for period.	
Observation times		:00, 06, 12, 18 UTC	
Elements monitored		:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees).	
Parameters monitored			
	:NOBS	:Number of observations received excluding duplicates.	
	:NGE	:Number of observations with gross errors.	
	:PGE	:Percentage of observations with gross errors.	
	:SD	:SD of difference of observations from background values excluding those with gross errors.	
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. a positive bias indicates the observation is veered to the background.**	
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.	
GROSS ERROR LIMIT	:15 hPa	(pressure)	
	:25 m s^{-1}	(vector wind)	
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.| bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
23948	-0.5	73.0	ALL	P	SUR	56	56	100	0.0	0.0	0.0
31527	-42.4	-21.5	ALL	P	SUR	91	4	4	6.8	-1.2	6.9
31530	-35.2	-24.6	ALL	P	SUR	79	76	96	1.5	-12.6	12.7
33504	-44.6	-38.5	ALL	P	SUR	247	0	0	1.3	-4.0	4.2
33505	-46.5	-26.1	ALL	P	SUR	94	92	98	2.6	-8.7	9.1
33574	-37.9	-19.0	ALL	P	SUR	118	4	3	3.6	5.6	6.7
46905	37.4	-128.4	ALL	P	SUR	57	4	7	3.8	5.9	7.0
54928	-41.1	-100.8	ALL	P	SUR	232	0	0	1.9	-4.3	4.7
63662	69.9	10.3	ALL	P	SUR	64	64	100	0.0	0.0	0.0
WIND SPEED											
41506	16.0	-61.0	ALL	SPEED	SUR	385	0	0	3.5	-5.5	6.5
44624	61.4	-9.1	ALL	SPEED	SUR	995	3	0	3.0	-5.9	6.6
44762	39.3	-10.1	ALL	SPEED	SUR	134	0	0	3.4	-5.0	6.0
52534	10.1	125.7	ALL	SPEED	SUR	110	0	0	1.4	-5.1	5.3
52657	26.4	127.8	ALL	SPEED	SUR	87	0	0	2.5	-7.0	7.4
62697	51.7	-11.4	ALL	SPEED	SUR	494	0	0	3.8	-5.9	7.0
WIND DIRECTION											
21531	32.0	-177.8	ALL	DIRN.	SUR	66	0	0	70.1	-41.1	81.3
46632	53.4	-152.6	ALL	DIRN.	SUR	115	0	0	21.5	-35.5	41.5
52540	13.4	144.7	ALL	DIRN.	SUR	153	0	0	19.4	85.4	87.6
52650	0.3	134.6	ALL	DIRN.	SUR	205	0	0	83.0	-34.1	89.7
52657	26.4	127.8	ALL	DIRN.	SUR	126	0	0	110.8	18.2	112.3

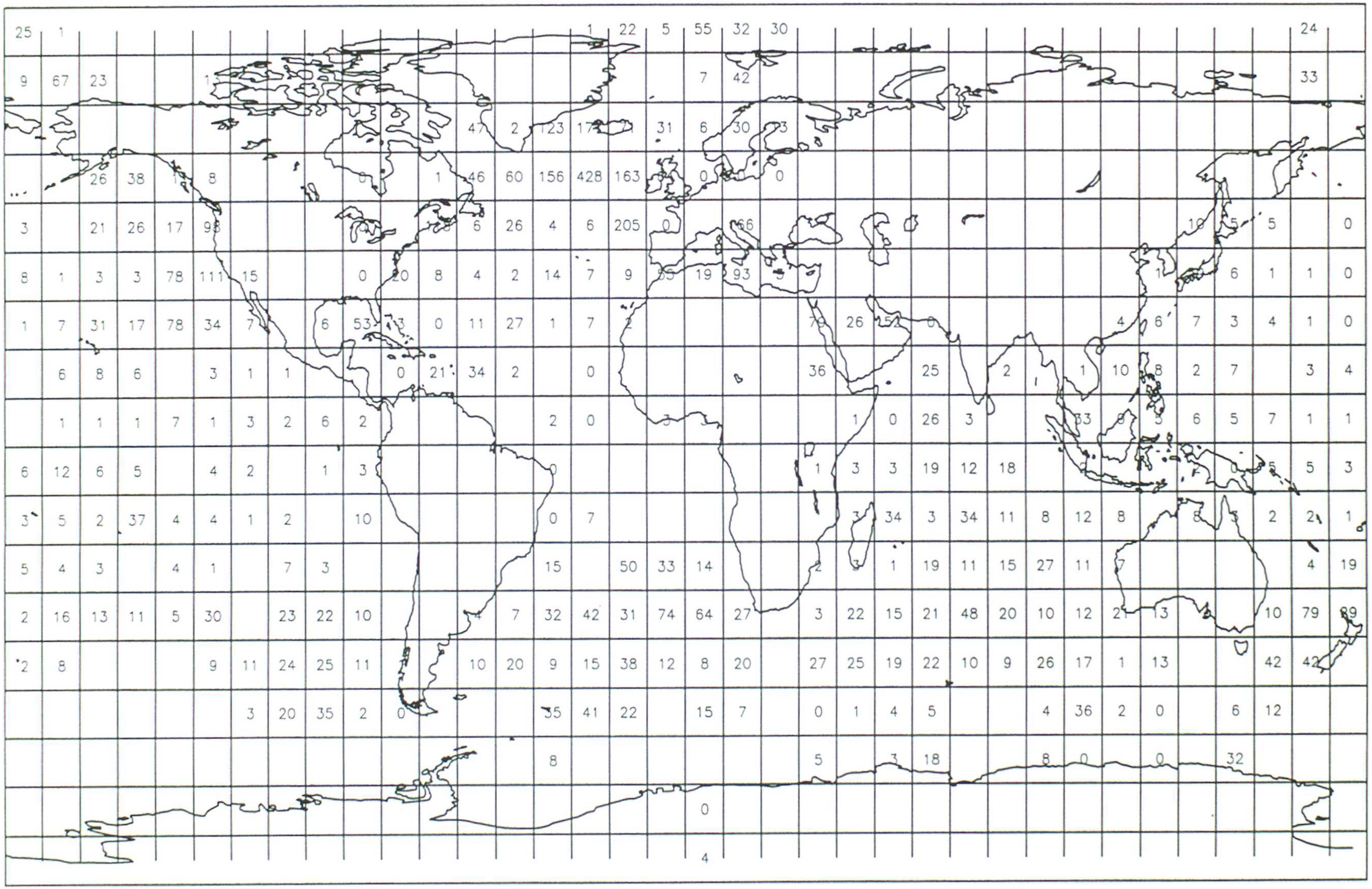
AVAILABILITY – DRIFTER – MARCH 1998

MAIN HOURS ONLY

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS = 5978

FIGURE 2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9 67 23 13 7 42 33
47 2 123 17 31 6 30 3
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3 21 26 17 98 6 26 4 6 205 0 66 10 5 5 0
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1 1 1 7 1 3 2 6 2 2 0 3 1 0 26 3 33 3 6 5 7 1 1
6 12 6 5 4 2 1 3 0 1 3 3 19 12 18 0 5 5 3
3 5 2 37 4 4 1 2 10 0 7 3 34 3 34 11 8 12 8 8 3 2 2 1
5 4 3 4 1 7 3 15 50 33 14 2 3 1 19 11 15 27 11 7 4 19
2 16 13 11 5 30 23 22 10 4 7 32 42 31 74 64 27 3 22 15 21 48 20 10 12 2 13 10 79 89
2 8 9 11 24 25 11 10 20 9 15 38 12 8 20 27 25 19 22 10 9 26 17 1 13 42 42
3 20 35 2 0 35 41 22 15 7 0 1 4 5 4 36 2 0 6 12
8 5 3 18 8 0 0 32
0
4

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Mean sea level pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.| bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60445	36.2N	5.4E	1081	S8	115	0	0	0	0.6	4.9	4.9
60468	35.6N	6.2E	1052	S8	89	89	100	1	0.0	0.0	0.0
60511	35.3N	1.4E	1127	S8	112	103	92	2	0.2	14.7	14.7
60535	34.7N	3.3E	1144	S8	86	1	1	0	0.8	-6.2	6.3
60571	31.6N	2.2W	773	S8	112	0	0	0	0.8	-4.3	4.4
60670	24.6N	9.5E	1054	S8	105	6	6	14	1.3	8.2	8.3
61233	15.2N	7.3W	271	MS	56	0	0	0	0.8	-4.0	4.1
62402	26.2N	32.7E	78	M	22	22	100	0	0.0	0.0	0.0
62790	12.1N	24.9E	674	MS	42	0	0	7	2.0	4.0	4.5
63330	13.5N	39.5E	2070	MS	43	42	98	0	0.0	9.9	9.9
63333	11.1N	39.7E	1903	MS	56	0	0	0	0.9	4.6	4.7
63334	10.3N	37.7E	2515	MS	63	2	3	2	1.4	10.0	10.1
63402	7.7N	36.8E	1725	MS	53	2	4	4	1.7	6.4	6.6
63471	9.6N	41.9E	1260	MS	49	0	0	0	0.7	9.7	9.7
63478	5.9N	43.6E	295	MS	40	0	0	0	1.2	7.1	7.2
68396	26.5S	31.3E	641	S8	50	0	0	2	1.4	4.3	4.5
68442	29.1S	26.3E	1359	S8	104	0	0	0	1.1	-4.6	4.7
69679	43.9N	18.3E	1557	MS	111	111	100	5	0.0	0.0	0.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24671	63.9N	135.9E	402	M	111	2	2	9	3.0	6.3	7.0
30320	56.9N	105.7E	669	MS	109	54	50	2	1.8	-0.4	1.8
30554	54.5N	113.6E	995	MS	111	0	0	49	5.1	5.7	7.6
40743	36.2N	57.7E	941	MS	111	0	0	1	1.1	-5.5	5.6
40762	35.3N	59.2E	1333	MS	108	4	4	2	0.9	-13.0	13.0
41254	23.1N	57.7E	1755	S8	81	81	100	0	0.0	0.0	0.0
41466	13.7N	44.1E	1402	8	25	0	0	0	0.8	-6.0	6.1
44416	28.6N	81.6E	720	MS	74	3	4	4	2.6	4.1	4.9
44477	27.0N	87.4E	1445	S8	66	66	100	3	0.0	0.0	0.0
51334	44.6N	82.9E	321	M	114	0	0	2	2.5	4.3	5.0
52602	38.8N	93.4E	2734	S	116	0	0	1	1.5	-6.1	6.3
52866	36.6N	101.8E	2262	S	116	0	0	1	1.5	-4.0	4.3
53588	39.0N	113.5E	2898	S	114	112	98	4	6.9	-2.1	7.2
54587	39.1N	123.2E	-85	M	97	2	2	4	2.1	-4.4	4.9
56021	34.1N	95.8E	4176	S	116	0	0	0	0.9	-4.1	4.2
56144	31.8N	98.6E	3184	S	102	0	0	0	1.3	-4.6	4.8
56385	29.5N	103.3E	3049	S	115	0	0	14	2.1	-7.7	8.0
56444	28.5N	98.9E	3488	S	106	25	24	2	0.8	13.8	13.8
56462	29.0N	101.5E	2994	S	112	0	0	0	1.6	8.0	8.2
58437	30.1N	118.2E	1836	S	115	0	0	57	2.5	-5.0	5.6
58445	30.3N	119.4E	1494	S	116	0	0	18	2.6	-6.2	6.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83214	10.3S	54.9W	285	MS	56	0	0	2	1.9	-6.0	6.3
83319	14.7S	52.4W	315	MS	68	0	0	0	1.1	-4.4	4.5
83332	14.1S	46.4W	826	MS	80	1	1	3	6.6	5.2	8.4
83344	15.0S	40.9W	840	MS	73	0	0	51	3.0	-5.6	6.4
83408	14.3S	43.8W	447	MS	76	0	0	51	6.2	3.3	7.0
83423	16.7S	49.3W	741	MS	82	0	0	0	0.9	-4.9	5.0
83488	17.8S	42.9W	1097	MS	78	78	100	3	0.0	0.0	0.0
83531	18.6S	46.5W	940	MS	78	0	0	49	2.3	-4.2	4.8
83587	19.9S	43.9W	850	MS	80	0	0	0	0.9	-6.6	6.7
83704	22.3S	53.9W	369	MS	59	0	0	3	3.9	-6.9	7.9

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
83773	23.1S	48.9W	793	S	31	0	0	0	1.0	-5.5	5.6
84401	5.2S	80.6W	49	MS	81	0	0	0	1.5	4.2	4.5
84455	6.5S	76.4W	281	MS	62	0	0	0	1.5	7.1	7.3
84472	7.1S	78.5W	2620	S	41	0	0	0	0.8	-5.9	6.0
84542	9.4S	77.6W	2750	S	37	0	0	0	1.0	4.7	4.8
84782	18.1S	70.3W	468	MS	80	0	0	0	1.4	8.1	8.2
85242	18.0S	67.1W	3072	S	46	25	54	39	0.6	0.0	0.6
85312	19.8S	63.9W	992	S	29	2	7	0	0.9	-10.7	10.7
85406	18.3S	70.3W	55	M	115	0	0	0	1.3	5.4	5.6

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
72576	42.8N	108.7W	1703	MS	114	0	0	0	1.3	4.4	4.6
76118	30.4N	109.7W	1040	MS	37	0	0	0	0.9	-9.9	9.9
76625	20.6N	100.4W	1813	MS	29	0	0	0	0.7	-7.0	7.0
76632	20.1N	98.7W	2417	MS	41	0	0	95	1.0	-4.4	4.5
76658	19.2N	103.7W	494	MS	43	0	0	0	1.2	7.1	7.2
76698	19.6N	88.0W	20	MS	97	0	0	62	1.3	-4.3	4.5
76762	17.5N	99.5W	1865	MS	83	83	100	1	0.0	0.0	0.0
76775	17.1N	96.7W	1550	MS	65	1	2	0	1.3	4.8	5.0
76845	16.7N	92.6W	2276	MS	99	93	94	1	0.4	14.5	14.5
78718	14.4N	87.6W	626	MS	20	17	85	90	0.2	-14.4	14.4

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94955	41.6S	145.7E	684	MS	103	103	100	2	0.0	0.0	0.0
95952	41.9S	145.6E	560	MS	111	111	100	1	0.0	0.0	0.0

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
02045	67.8N	20.4E	408	M	83	83	100	1	0.0	0.0	0.0
04201	77.5N	63.2W	16	MS	336	0	0	2	2.0	4.4	4.8
04207	81.7N	59.9W	105	MS	106	1	1	1	2.0	-4.5	4.9
04416	72.6N	38.4W	3202	S	94	85	90	2	6.7	3.4	7.5
11180	47.7N	15.8E	1546	S8	95	0	0	0	1.2	-4.1	4.3
16227	41.9N	13.6E	655	MS	275	257	93	2	6.8	-10.4	12.4
16549	39.1N	8.3E	12	MS	277	0	0	2	1.2	-4.5	4.7
16614	40.4N	21.3E	604	MS	86	0	0	1	1.0	-6.4	6.5

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	M	134	50	37	3	2.0	9.3	9.5
89108	89.0S	0.3W	2754	S	267	10	4	4	2.5	4.5	5.1
89264	71.4S	68.9W	780	S	233	0	0	2	2.0	4.1	4.6
89345	89.7S	148.8W	620	S	353	100	28	2	6.2	-8.7	10.7

TABLE 4

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :All hours combined.

Level(s) monitored :70.0 - 500.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP ≥ 20

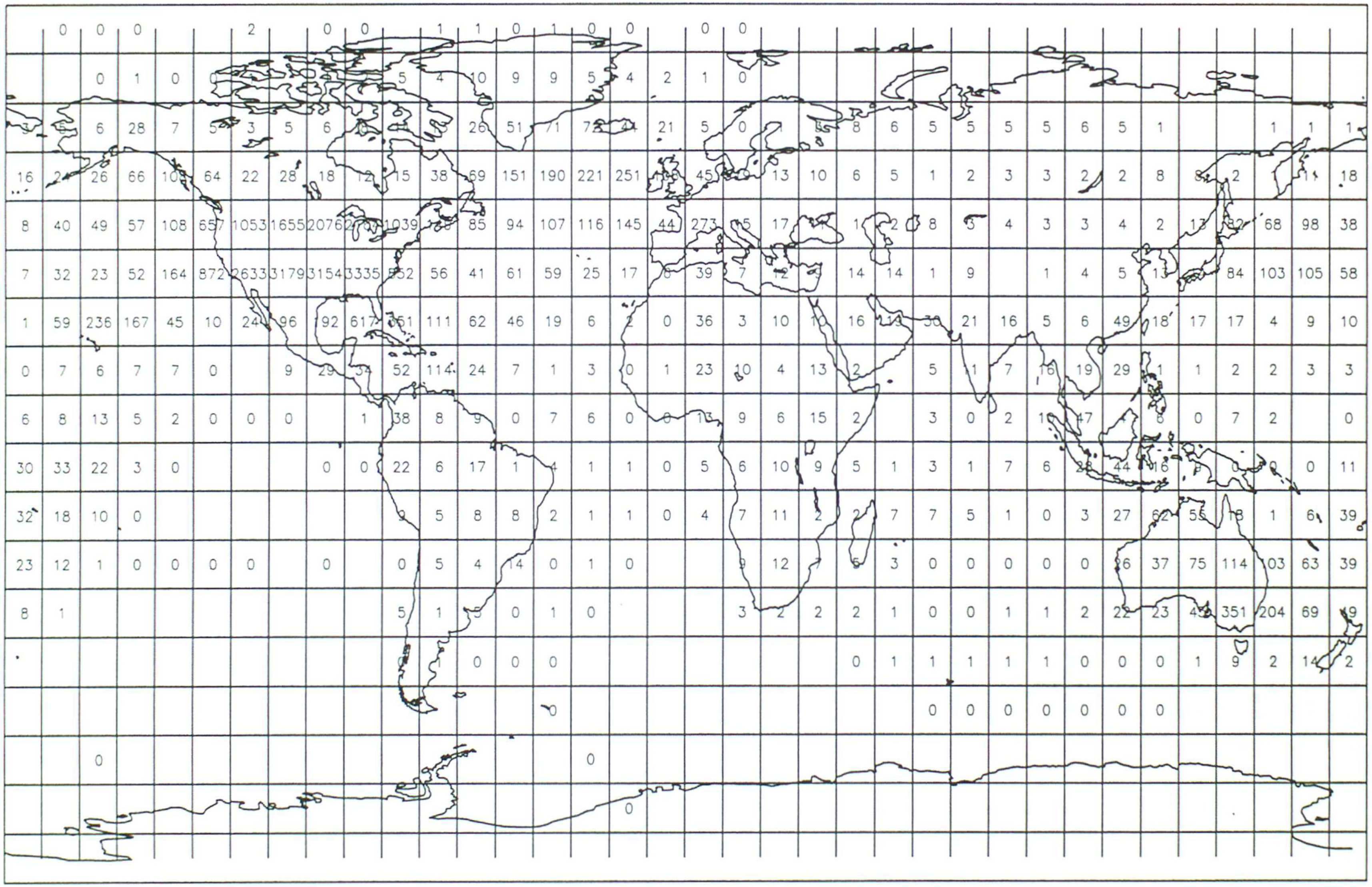
NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAA	118	0	21	1.9	0.8	224	0	50	0	6.8	0.6
AAH	37	3	46	3.8	2.6	66	0	21	0	12.8	1.8
AAL	6247	1	29	1.8	0.0	10495	0	12	0	8.8	0.5
AAR	1466	0	7	2.0	-0.6	2887	0	4	0	9.0	0.5
ACA	1835	1	11	1.8	-0.1	3264	0	3	0	7.5	0.6
ACI	46	2	7	1.4	0.5	89	0	2	0	7.1	0.2
AEA	548	2	24	2.8	1.1	924	0	9	0	10.3	0.9
AEL	829	0	6	1.9	-0.3	1590	0	3	0	9.5	0.4
AEY	158	1	6	1.6	0.7	298	0	4	0	8.9	0.3
AFL	392	1	11	2.1	0.5	706	0	4	0	8.6	0.5
AFR	1911	1	12	1.8	0.1	3540	0	6	0	8.6	0.6
AIH	282	1	6	1.7	0.4	429	0	3	0	8.9	0.7
AJM	77	3	6	2.1	-0.7	129	0	3	0	10.8	0.3
AMT	731	1	102	2.6	1.5	1425	0	23	0	8.8	0.1
AMX	266	0	5	1.9	-0.2	529	0	3	0	9.6	1.0
ANA	1059	0	9	1.9	-0.2	2097	0	5	0	9.2	0.8
ANO	40	0	0	0.9	0.0	80	0	0	0	4.4	1.3
ANZ	2817	2	28	1.7	0.0	5451	0	13	0	8.4	0.4
AOM	814	1	7	1.8	0.9	1462	0	3	0	8.5	0.4
ARG	24	21	42	4.3	0.8	49	8	31	0	30.7	-5.5
AUA	27	0	19	2.2	0.0	40	0	5	0	4.4	0.3
AVA	393	1	4	1.9	-0.1	775	1	3	0	11.7	0.5
AVN	39	0	0	1.2	0.2	74	0	0	0	8.2	0.9
AXA	126	6	35	1.3	0.4	237	0	16	0	10.3	0.6
AZA	505	1	28	2.0	-0.2	722	0	10	0	7.9	0.6
BAL	789	0	14	1.6	-0.5	1509	0	7	0	8.4	0.5
BAW	1673	1	22	2.0	-0.2	2769	0	8	0	8.2	0.8
BBB	59	2	7	1.8	-0.6	95	0	2	0	9.6	0.3
BWA	378	1	12	2.1	0.8	664	0	5	0	9.5	0.1
CAL	1670	1	7	1.9	-0.2	3319	0	4	0	9.5	0.6
CCA	209	1	9	2.3	0.1	349	0	8	0	12.4	0.4
CDN	2156	0	12	2.0	0.5	4208	0	6	0	8.7	0.7
CES	297	1	7	1.9	0.4	571	1	5	0	11.6	0.3
CFC	33	0	15	2.5	0.0	66	0	8	0	10.9	1.6
CFG	1197	1	6	1.8	-0.9	2269	0	3	0	9.6	0.5
CKS	361	1	102	2.5	1.0	660	0	20	0	8.8	0.2
CKT	204	0	13	1.8	0.5	356	0	5	0	9.8	0.0
CLX	317	0	8	2.0	-0.7	592	0	3	0	7.6	0.4
CMI	554	1	5	1.8	0.8	1111	0	3	0	8.6	0.7
CMM	778	2	19	2.1	0.5	1504	0	10	0	10.9	1.1
COA	1949	1	37	2.4	0.7	3358	0	16	0	11.1	0.8
CPA	82	2	5	1.9	-1.0	162	0	1	0	7.0	0.7
CRL	689	1	9	1.9	0.5	1280	0	4	0	9.4	0.4
CSN	94	2	7	2.4	0.3	185	0	3	0	8.7	1.0
CTB	160	1	5	1.4	0.1	308	0	4	0	8.1	0.6
CTM	45	2	16	1.9	-0.7	80	0	9	0	14.4	1.0
CUB	458	1	7	2.6	1.5	857	0	50	0	12.5	0.8
DAL	6638	1	35	2.3	0.4	11274	0	15	0	8.8	0.5
DBY	175	0	2	1.5	-0.7	346	0	2	0	10.2	0.3
DHL	180	7	54	4.6	-2.8	260	0	13	0	11.7	0.9
DLH	2766	2	19	1.9	-0.1	4862	0	7	0	8.0	0.7
DOA	42	0	5	1.3	0.0	80	0	4	0	8.3	0.4
EIA	317	1	33	1.5	0.2	614	0	17	0	8.4	0.8
EIN	23	0	30	2.6	1.0	41	2	17	0	11.4	1.3
ELY	151	0	13	1.5	-0.3	292	0	5	0	7.8	1.1
EVA	1700	0	7	1.9	-0.4	3354	0	4	0	9.3	0.5
EWW	84	2	14	2.5	0.9	155	0	6	0	11.4	0.9
FDX	1005	0	20	1.9	0.6	1943	0	10	0	9.0	0.6
FFF	151	0	26	1.4	0.8	262	15	58	0	38.5	0.3

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
FIN	317	0	16	2.0	0.4	519	0	3	0	7.1	0.4
FJI	497	7	25	1.4	0.5	917	0	10	0	7.9	0.3
FOM	132	5	39	1.6	0.7	253	0	19	0	10.6	0.8
GAF	49	4	22	2.0	0.8	85	0	6	0	8.2	0.2
GCO	51	0	18	2.1	1.6	108	0	8	0	7.0	0.5
GHA	31	0	6	1.7	0.5	39	0	5	0	6.1	0.4
GIA	215	1	34	1.7	0.8	399	1	16	0	8.7	0.8
HAL	2765	0	38	1.9	0.5	5467	0	19	0	10.7	0.7
HLF	161	0	15	1.8	-0.6	271	0	4	0	8.5	0.7
HLQ	70	3	7	1.5	0.6	140	0	2	0	8.5	1.4
HRH	86	13	55	1.9	0.8	150	0	24	0	6.5	0.4
IBE	2212	2	23	2.2	0.5	3914	0	9	0	10.3	0.4
ICE	624	1	33	2.0	-0.1	930	0	9	0	6.2	0.6
JAL	5879	0	5	2.0	0.3	11667	0	3	0	8.9	0.7
JAZ	89	0	6	2.5	2.0	177	0	3	0	9.0	1.0
KAL	2900	1	7	2.0	-0.3	5674	0	4	0	9.1	0.6
KLM	2765	1	14	1.8	0.0	5039	0	5	0	8.2	0.5
LAN	26	8	15	2.7	-0.1	46	0	4	0	11.8	0.0
LAP	52	27	56	5.9	3.8	101	4	26	0	28.2	-2.7
LDA	289	2	20	1.7	-0.9	512	0	8	0	8.9	0.4
LDI	547	1	29	2.0	-0.3	921	0	12	0	8.7	0.3
LEI	333	0	13	1.7	0.1	582	0	4	0	9.1	0.4
LIB	401	1	6	1.8	0.7	780	0	3	0	10.1	0.4
LOT	169	2	18	2.3	-1.3	281	0	6	0	11.4	0.2
LTE	24	8	8	1.4	-0.9	52	0	6	0	7.0	1.5
LTU	886	0	23	1.9	0.0	1426	0	7	0	8.2	0.7
MAA	20	0	40	2.5	-0.8	32	0	16	0	10.2	4.0
MAS	285	1	7	1.8	-0.7	516	0	54	0	8.2	0.7
MDA	149	0	0	1.9	0.0	299	0	1	0	7.7	0.1
MON	49	2	16	1.8	0.2	86	0	7	0	10.3	1.1
MPD	257	1	16	2.3	0.8	468	0	7	0	9.9	0.4
MPH	1012	1	9	1.9	-0.8	1882	0	3	0	9.1	0.2
NCA	566	1	5	1.6	0.3	1119	0	3	0	9.3	0.6
NWA	9659	1	14	2.0	0.6	18561	0	7	0	8.9	0.6
PAC	197	1	30	2.1	-0.1	359	0	13	0	8.9	0.7
PAL	1098	1	13	1.8	-0.3	2156	0	7	0	9.3	0.4
PAO	235	3	40	1.5	0.1	462	0	19	0	7.8	0.9
QFA	1482	1	32	1.5	0.2	2873	0	16	0	7.8	0.4
RAF	119	0	7	2.1	0.5	237	0	4	0	10.3	0.4
RAM	78	3	9	1.9	-0.1	152	0	5	0	9.6	1.1
RCH	489	1	25	2.7	1.3	847	0	12	0	10.7	0.7
RJA	35	0	26	1.6	0.4	52	0	10	0	6.4	0.2
RKA	171	1	8	2.4	0.1	234	1	5	0	9.6	0.2
ROT	22	5	41	1.8	-1.4	38	0	13	0	6.9	1.1
ROY	24	0	4	2.1	0.5	46	0	0	0	10.4	-0.5
RRR	82	0	26	2.2	-0.6	145	0	11	0	8.5	0.9
SAA	269	1	5	1.8	-0.6	507	0	3	0	10.4	0.3
SAB	27	0	11	2.1	0.4	40	0	5	0	8.8	0.6
SAS	1197	0	2	1.8	-0.1	2379	0	1	0	7.6	0.6
SCX	320	0	45	1.7	0.6	541	0	20	0	8.9	0.4
SIA	1169	1	7	2.0	-0.7	2285	0	4	0	9.6	0.4
SLR	118	2	21	1.6	-0.2	234	0	11	0	9.3	-0.1
SOL	29	0	7	1.2	0.0	58	0	3	0	8.1	0.0
SPP	219	0	25	2.1	-0.2	337	0	7	0	10.7	0.5
SVA	81	0	11	1.9	-0.5	160	0	51	0	10.4	0.7
SVV	23	4	13	3.2	-0.1	47	0	11	0	17.9	0.8
SWR	177	1	24	1.5	0.2	285	0	9	0	9.8	0.8
TAP	542	1	6	1.9	-0.5	1062	0	3	0	9.2	0.4
TBA	47	2	21	1.9	0.8	99	0	12	0	15.0	-0.5

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
THA	457	1	7	1.8	-0.4	889	0	5	0	9.9	0.5
TOW	128	4	28	2.6	0.6	207	0	10	0	9.8	1.0
TPA	35	3	14	1.2	0.4	68	0	6	0	10.2	0.2
TWA	1714	0	32	2.0	-0.1	2570	0	12	0	9.0	0.6
UAL	100582	1	73	1.6	-0.2	200261	0	37	0	6.8	0.4
UNS	982	0	100	1.7	0.8	1957	0	50	0	7.2	0.5
UPS	1065	1	37	1.9	0.0	1975	0	17	0	9.3	0.4
USA	284	1	29	1.8	-0.2	425	0	50	0	12.9	0.7
VIR	347	1	16	1.9	-0.5	592	0	4	0	8.6	1.0
VKG	31	3	16	1.7	1.0	53	0	6	0	6.4	0.5
VRG	301	3	19	2.0	0.8	561	0	7	0	10.0	0.4
VSP	171	2	8	2.4	0.6	322	0	52	0	9.8	0.5
VVR	35	6	37	3.1	-0.1	79	1	18	0	10.2	0.3
WOA	80	0	3	1.5	0.5	159	0	1	0	10.3	0.4
XAS	23	0	35	2.6	-2.0	38	0	18	0	13.8	1.2
AN	20100	0	0	1.0	0.0	40200	0	0	0	5.6	0.5
AR	427	3	36	1.7	1.3	854	0	17	0	8.0	0.5
BA	21868	0	1	1.5	0.5	43571	0	6	0	7.0	0.7
FJ	22	5	9	2.2	0.6	42	0	0	0	5.8	0.4
IT	410	0	28	1.1	0.4	820	0	14	0	6.8	0.5
KL	12244	0	18	1.6	0.8	24476	0	9	0	7.3	0.5
LH	1976	1	2	1.7	0.9	4000	0	1	0	7.4	0.6
MK	1995	0	0	1.9	1.7	3968	0	0	0	7.0	0.9
QF	20704	0	1	1.2	0.4	41403	0	1	0	6.3	0.5
SA	2313	0	1	2.4	2.0	4624	0	8	0	7.1	0.6
SV	1886	0	0	1.8	0.9	3754	0	0	0	7.2	0.7
UA	1827	2	28	1.9	0.3	3698	0	14	0	9.2	1.0
WA	586	9	12	2.0	0.5	1106	3	10	6	14.0	-1.2
XX	3581	2	4	1.9	0.5	7978	0	5	1	13.6	0.5
N	725	2	25	2.5	0.6	1221	0	10	0	10.0	0.8
ADS	1413	0	0	1.3	-0.2	2826	0	0	0	6.2	0.6
US ACAR	520516	0	12	1.5	0.2	******	0	6	0	6.6	0.5

MEAN DAILY COUNT OF AIRCRAFT 70 – 500 HPA FIGURE 3
MARCH 1998
OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED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0 1 0 0 5 4 10 9 9 5 4 2 1 0
3 6 28 7 5 3 5 6 26 51 71 73 41 21 5 0 8 6 5 5 5 5 6 5 1 1 1 1
16 24 26 66 108 64 22 28 18 12 15 38 69 151 190 221 251 45 13 10 6 5 1 2 3 3 2 2 8 8 2 11 18
8 40 49 57 108 657 1053 1655 2076 1039 85 94 107 116 145 44 273 15 17 1 2 8 3 4 3 3 4 2 13 32 68 98 38
7 32 23 52 164 872 2633 3179 3154 3335 552 56 41 61 59 25 17 39 7 12 14 14 1 9 1 4 5 13 84 103 105 58
1 59 236 167 45 10 24 96 192 617 351 111 62 46 19 6 2 0 36 3 10 10 16 30 21 16 5 6 49 18 17 17 4 9 10
0 7 6 7 7 0 9 29 34 52 114 24 7 1 3 0 1 23 10 4 13 2 5 11 7 16 19 29 1 1 2 2 3 3
6 8 13 5 2 0 0 0 1 38 8 9 0 7 6 0 0 13 9 6 15 2 3 0 2 10 47 4 6 0 7 2 0
30 33 22 3 0 0 0 22 6 17 1 4 1 1 0 5 6 10 9 5 1 3 1 7 6 28 44 16 0 0 11
32 18 10 0 9 5 8 8 2 1 1 0 4 7 11 2 2 7 7 5 1 0 3 27 62 55 18 1 6 39
23 12 1 0 0 0 0 0 0 5 4 14 0 1 0 9 12 7 5 3 0 0 0 0 0 26 37 75 114 103 63 39
8 1 5 1 5 0 1 0 3 2 2 2 1 0 0 1 1 2 22 23 43 351 204 69 49
0 1 0 0 0 0 1 1 1 1 0 0 0 1 9 2 14 2
0 0 0 0 0 0 0 0
0 0
0

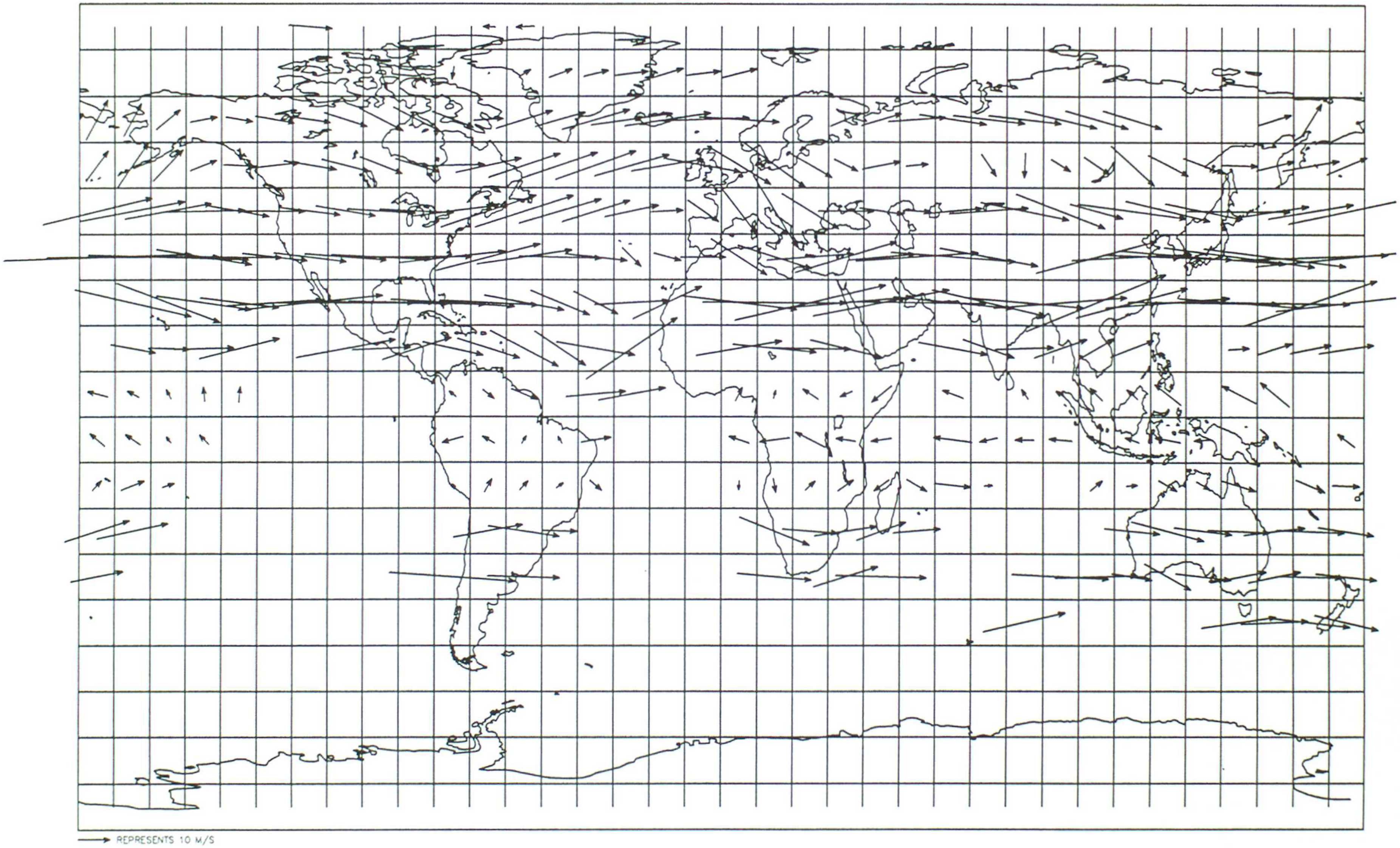
AIRCRAFT MEAN WINDS BETWEEN 70 AND 500 HPA

FIGURE 4

MARCH 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



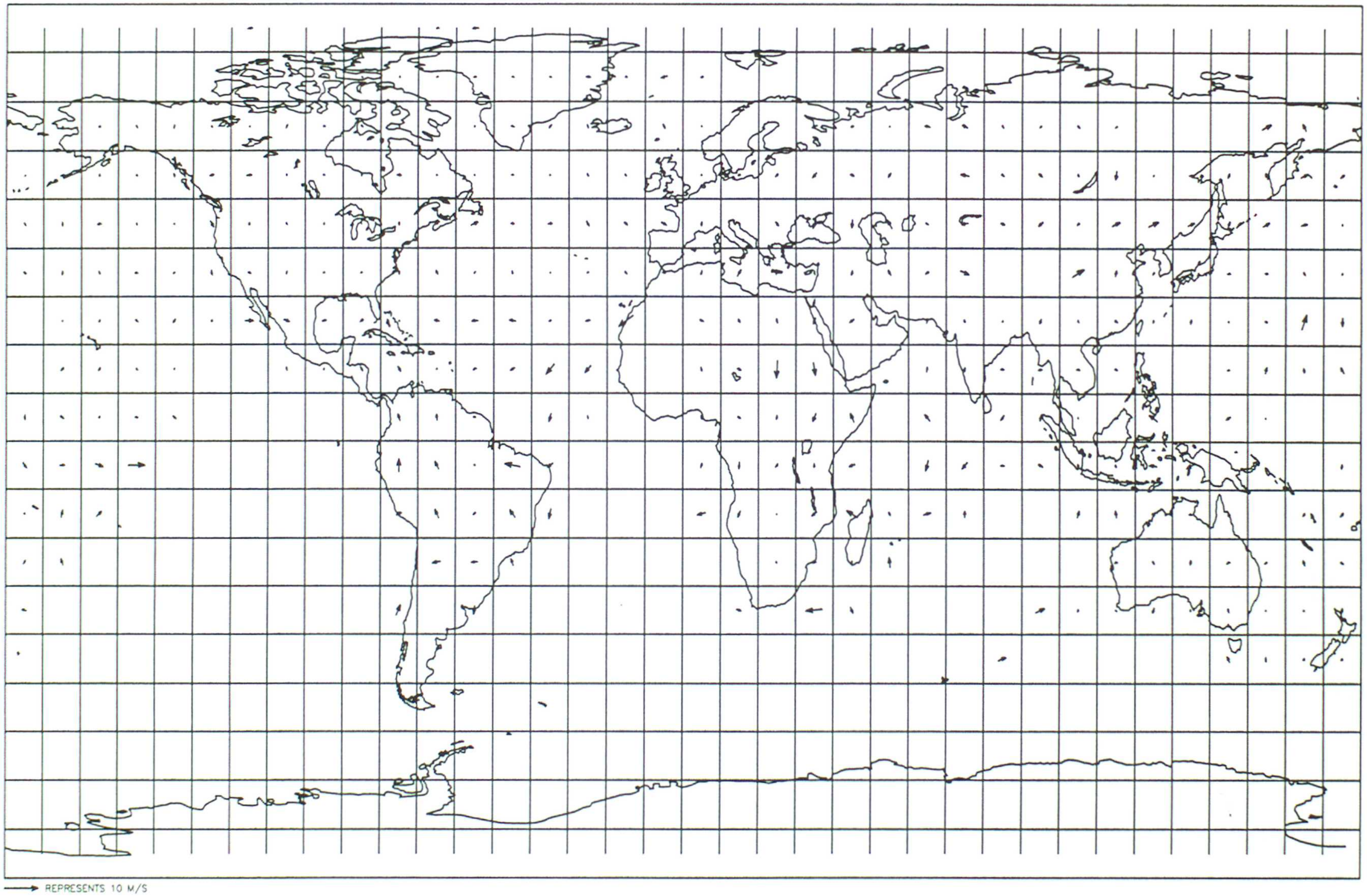
AIRCRAFT MEAN O–B WINDS BETWEEN 70 AND 500 HPA

FIGURE 5

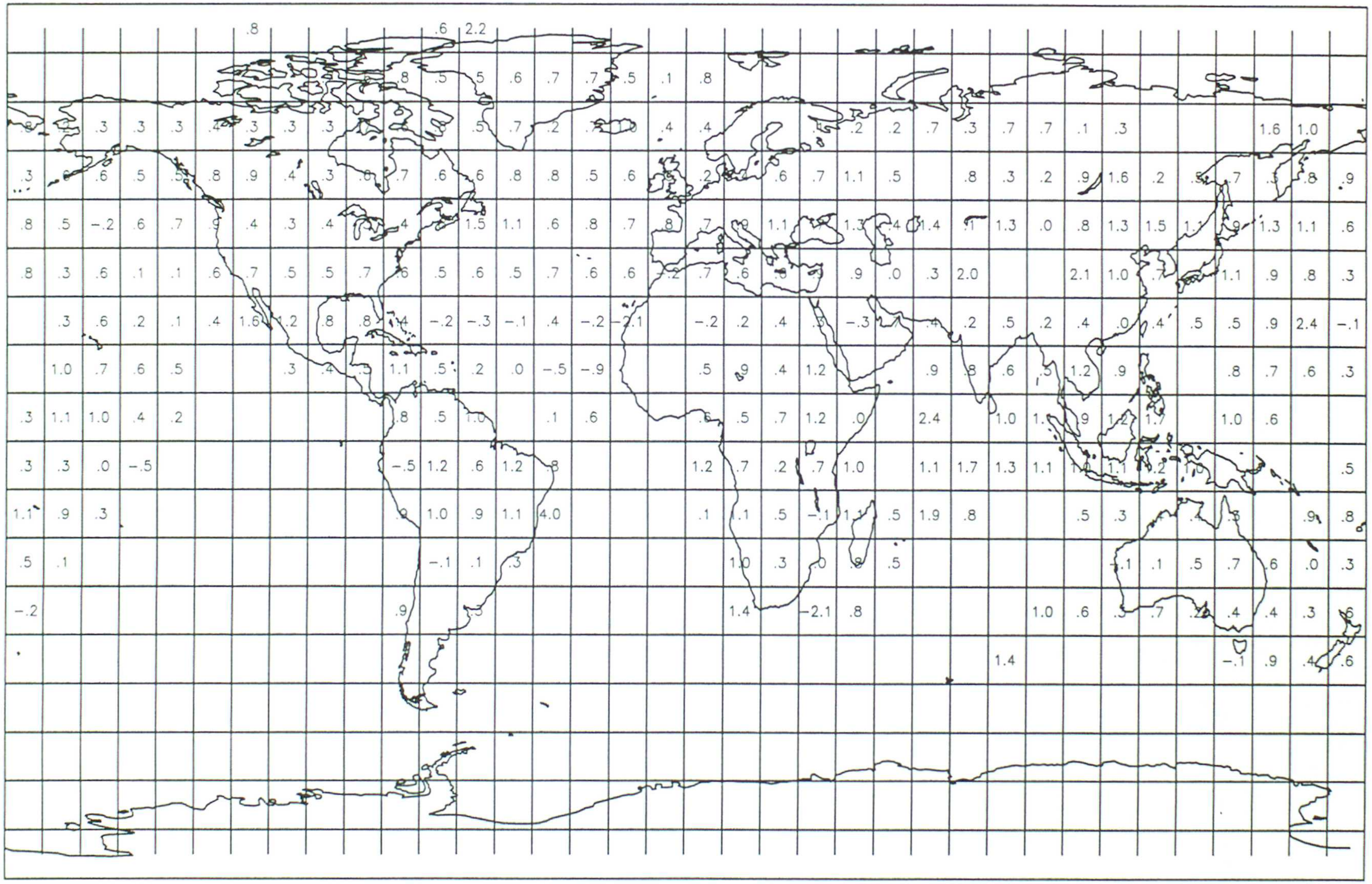
MARCH 1998

OBSERVATIONS WITH O–B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED

VALUES ARE PRINTED WHERE MORE THAN 30 OBS ARE PRESENT



AIRCRAFT : MEAN O−B SPEEDS (M/S) BETWEEN 70 AND 500 HPA FIGURE 6
MARCH 1998
OBSERVATIONS WITH O−B VECTOR DIFFERENCE > 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT


.8 .6 2.2
.8 .5 .5 .6 .7 .7 .5 .1 .8
.3 .3 .3 .4 .3 .3 .3 .8 .5 .7 .2 .4 .4 .2 .2 .7 .3 .7 .7 .1 .3 1.6 1.0
.3 .6 .5 .5 .8 .9 .4 .3 .7 .6 .6 .8 .8 .5 .6 .2 .6 .7 1.1 .5 .8 .3 .2 .9 1.6 .2 .5 .7 .8 .9
.8 .5 −.2 .6 .7 .4 .3 .4 .4 1.5 1.1 .6 .8 .7 .8 .7 1.1 1.3 .4 1.4 .1 1.3 .0 .8 1.3 1.5 1.3 1.1 .6
.8 .3 .6 .1 .1 .6 .7 .5 .5 .7 .6 .5 .6 .5 .7 .6 .6 .2 .7 .6 .9 .0 .3 2.0 2.1 1.0 1.1 .9 .8 .3
.3 .6 .2 .1 .4 1.6 1.2 .8 .8 .4 −.2 −.3 −.1 .4 −.2 −2.1 −.2 .2 .4 −.3 .4 .2 .5 .2 .4 .0 .4 .5 .5 .9 2.4 −.1
1.0 .7 .6 .5 .3 .4 1.1 .5 .2 .0 −.5 −.9 .5 .9 .4 1.2 .9 .8 .6 1.2 .9 .8 .7 .6 .3
.3 1.1 1.0 .4 .2 .8 .5 1.0 .1 .6 .5 .7 1.2 .0 2.4 1.0 .9 1.7 1.0 .6
.3 .3 .0 −.5 −.5 1.2 .6 1.2 .8 1.2 .7 .2 .7 1.0 1.1 1.7 1.3 1.1 1.1 .2 .5
1.1 .9 .3 .9 1.0 .9 1.1 4.0 .1 .1 .5 −.1 .5 1.9 .8 .5 .3 .9 .8
.5 .1 −.1 .1 .3 1.0 .3 .0 .5 −.1 .1 .5 .7 .6 .0 .3
−.2 .9 1.4 −2.1 .8 1.0 .6 .7 .4 .4 .3 .6
1.4 −.1 .9 .4 .6

AIRCRAFT : RMS O-B VECTOR (M/S) BETWEEN 70 AND 500 HPA FIGURE 7
MARCH 1998
OBSERVATIONS WITH O-B VECTOR DIFFERENCE GREATER THAN 60 MPS EXCLUDED
VALUES ARE PRINTED WHERE > 30 OBS ARE PRESENT

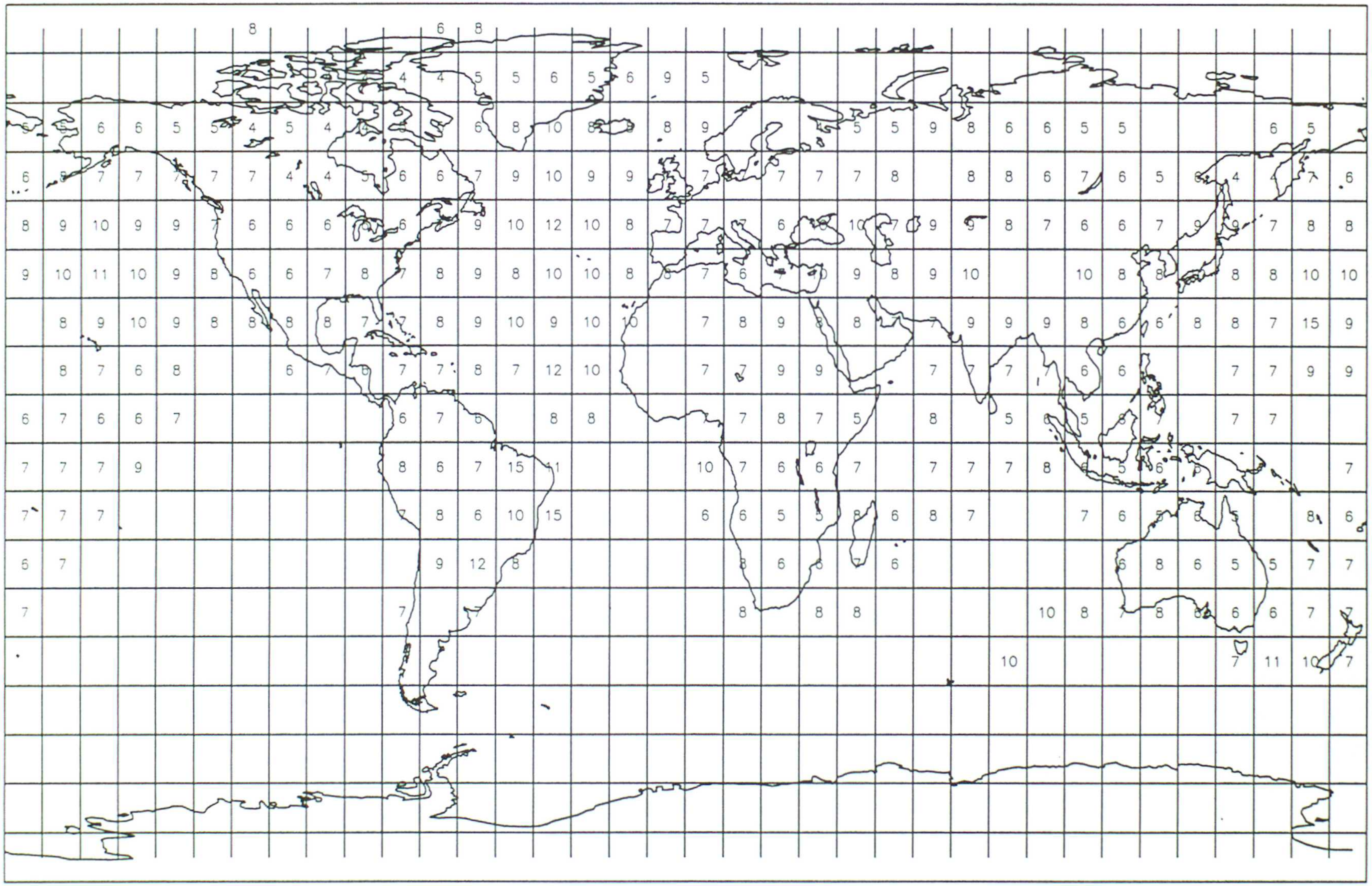

8 6 8
4 4 5 5 6 5 6 9 5
5 5 6 6 5 5 4 5 4 4 4 6 8 10 8 9 8 9 5 5 9 8 6 6 5 5 6 5
6 6 7 7 7 7 7 4 4 5 6 6 7 9 10 9 9 7 7 7 7 8 8 8 6 7 6 5 6 4 4 7 6
8 9 10 9 9 7 6 6 6 6 6 9 10 12 10 8 7 7 7 6 6 10 7 9 9 8 7 6 6 7 9 9 7 8 8
9 10 11 10 9 8 6 6 7 8 7 8 9 8 10 10 8 6 7 6 7 10 9 8 9 10 10 8 8 8 8 10 10
8 9 10 9 8 8 8 8 7 7 8 9 10 9 10 10 7 8 9 8 8 7 9 9 9 8 6 6 8 8 7 15 9
8 7 6 8 6 7 6 7 7 8 7 12 10 7 7 9 9 7 7 7 7 6 6 7 7 9 9
6 7 6 6 7 6 7 6 8 8 7 7 8 7 5 8 5 6 5 6 7 7 7
7 7 7 9 8 6 7 15 11 10 7 6 6 7 7 7 7 8 6 5 6 6 7
7 7 7 7 8 6 10 15 6 6 5 3 8 6 8 7 7 6 5 6 5 8 6
6 7 9 12 8 8 6 6 7 6 6 8 6 5 5 7 7
7 7 7 8 8 8 10 8 7 8 6 6 6 7 7
10 7 11 10 7

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
33317	00	Z	100	50/ 27	12	0	38.4	160.5	165.0	5
33393	00	Z	100	50/ 24	12	0	42.9	137.7	144.3	5
33658	00	Z	100	48/ 26	12	0	52.1	178.0	185.5	6
33791	12	Z	100	48/ 33	11	1	41.0	207.7	211.7	6
33837	00	Z	100	46/ 31	13	0	73.6	120.2	141.0	5
33946	00	Z	50	45/ 34	10	0	23.9	208.3	209.7	7
42027	00	Z	100	34/ 75	13	1	104.0	-121.2	159.7	6
42101	00	Z	200	30/ 76	21	0	63.2	-90.1	110.1	6
42314	12	Z	150	27/ 95	11	0	71.7	-120.8	140.5	4
42339	12	Z	150	26/ 73	23	0	105.1	29.2	109.1	6
42369	00	Z	100	27/ 81	11	0	109.0	98.5	147.0	7
42492	00	Z	300	26/ 85	22	0	50.5	-54.9	74.6	5
42492	12	Z	150	26/ 85	16	0	96.1	-72.4	120.3	4
42647	12	Z	200	23/ 73	11	0	50.5	64.8	82.2	4
42667	12	Z	100	23/ 77	13	0	133.6	100.2	167.0	6
42971	00	Z	200	20/ 86	24	0	88.9	8.7	89.3	6
42971	12	Z	100	20/ 86	21	0	123.3	10.9	123.8	5
43003	12	Z	100	19/ 73	13	0	71.6	174.5	188.6	6
43014	00	Z	150	20/ 75	8	6	65.1	-202.2	212.5	7
43014	12	Z	100	20/ 75	6	8	89.2	-167.5	189.8	5
43041	12	Z	100	19/ 82	10	0	91.7	63.7	111.6	4
43128	00	Z	100	17/ 78	22	1	131.0	-74.6	150.7	6
43150	12	Z	100	18/ 83	23	0	103.8	37.3	110.4	4
43185	00	Z	100	16/ 81	21	0	128.3	44.0	135.6	4
43185	12	Z	150	16/ 81	22	0	98.0	95.7	137.0	6
43192	00	Z	100	15/ 74	23	2	122.8	-79.6	146.4	6
43192	12	Z	150	15/ 74	21	0	93.6	37.5	100.8	6
43279	12	Z	100	13/ 80	25	0	87.2	67.8	110.5	4
43295	12	Z	150	13/ 78	11	0	86.0	143.2	167.0	5
43346	00	Z	100	11/ 80	24	0	101.3	-86.8	133.4	4
43353	00	Z	150	10/ 76	18	0	85.5	-55.5	101.9	6
43353	12	Z	150	10/ 76	16	0	85.8	53.9	101.3	4
43369	12	Z	100	8/ 73	11	0	80.3	122.3	146.3	4
43371	12	Z	200	8/ 77	24	0	76.3	37.8	85.2	4
54497	12	Z	250	40/ 124	27	0	44.4	78.5	90.2	5
72376	00	Z	1000	37/-108	24	0	23.6	32.9	40.5	5
72376	12	Z	1000	37/-108	24	0	29.1	22.6	36.9	4
89009	00	Z	500	-90/ 0	22	3	45.5	46.0	64.7	7
89664	00	Z	400	-78/ 167	7	5	36.5	110.3	116.2	6
96237	00	Z	150	-2/ 106	12	0	116.9	-77.3	140.2	7
97560	12	Z	300	-1/ 136	18	0	35.1	-71.4	79.6	6

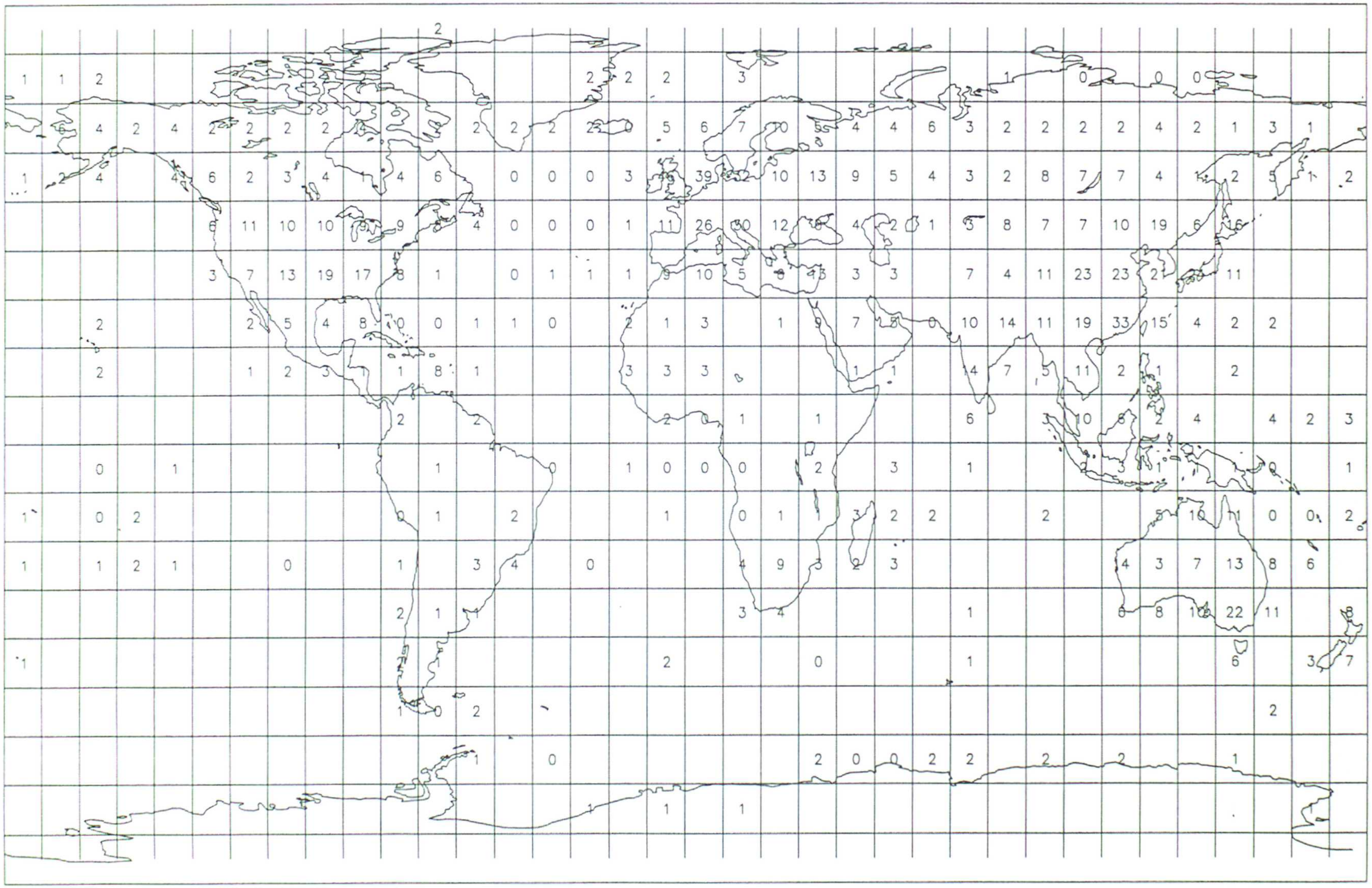
AVAILABILITY – TEMP – 500 HPA GEOPOTENTIAL – MARCH 1998

FIGURE 8

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1398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1 2 4 4 6 2 3 4 1 4 6 0 0 0 3 49 39 52 10 13 9 5 4 3 2 8 7 7 4 1 2 5 1 2
6 11 10 10 9 9 4 0 0 0 1 11 26 30 12 18 4 2 1 3 8 7 7 10 19 6 16
3 7 13 19 17 8 1 0 1 1 1 9 10 5 8 43 3 3 7 4 11 23 23 21 11
2 2 5 4 8 10 0 1 1 0 2 1 3 1 9 7 5 0 10 14 11 19 33 15 4 2 2
2 1 2 3 1 1 8 1 3 3 3 1 1 14 7 5 11 2 1 2
2 2 2 0 1 1 6 3 10 8 2 4 4 2 3
0 1 1 0 1 0 0 0 2 3 1 2 3 1 1 0 1
1 0 2 0 1 2 1 0 1 1 3 2 2 2 5 10 11 0 0 2
1 1 2 1 0 1 3 4 0 4 9 3 2 3 4 3 7 13 8 6
2 1 1 3 4 1 6 8 10 22 11 8
1 1 2 0 1 6 3 7
1 0 2 2
1 0 2 0 0 2 2 2 2 1
1 1 1 1

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from each unique identifier for radiosonde TEMPs.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from Bracknell global model.
Observation times	:00 UTC and 12 UTC.
Level(s) monitored	:Standard levels between 1000.0 - 100.0 hPa
Element monitored	:VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS	:Number of observations available at level shown during period.
:NUM GROSS	:Number of gross errors at level shown during period.
:% REJ	:Percentage of observations rejected by quality control at level shown during period.
:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
:NUM LEVELS	:Number of levels satisfying selection criteria.

GROSS ERROR LIMITS	:Defined in Appendix I.2
SELECTION CRITERIA	: ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
17240	00	V	250	38/ 31	22	0	4	-10.9	-0.6	15.8	1
17240	12	V	250	38/ 31	24	0	12	-10.0	-2.5	17.1	1
42724	00	V	200	24/ 91	15	0	6	-17.2	3.7	18.7	2
42724	12	V	200	24/ 91	12	0	0	-13.9	1.0	17.8	2
54497	00	V	200	40/ 124	25	1	11	-1.2	10.2	16.5	2
62337	12	V	200	31/ 34	21	2	21	-5.2	27.4	15.6	1
62378	12	V	200	30/ 31	12	0	8	0.5	-1.1	19.6	2
62420	00	V	500	28/ 29	12	0	25	-21.1	-5.2	15.3	1
76458	00	V	300	23/-106	11	1	16	11.7	5.4	16.1	1

AVAILABILITY – TEMP/PILOT – 300 HPA WIND – MARCH 1998

FIGURE 9

ALL HOURS

10 DEGREE BOX AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS

GLOBAL AVERAGE NUMBER OF OBSERVATIONS IN 24 HOURS – 1203

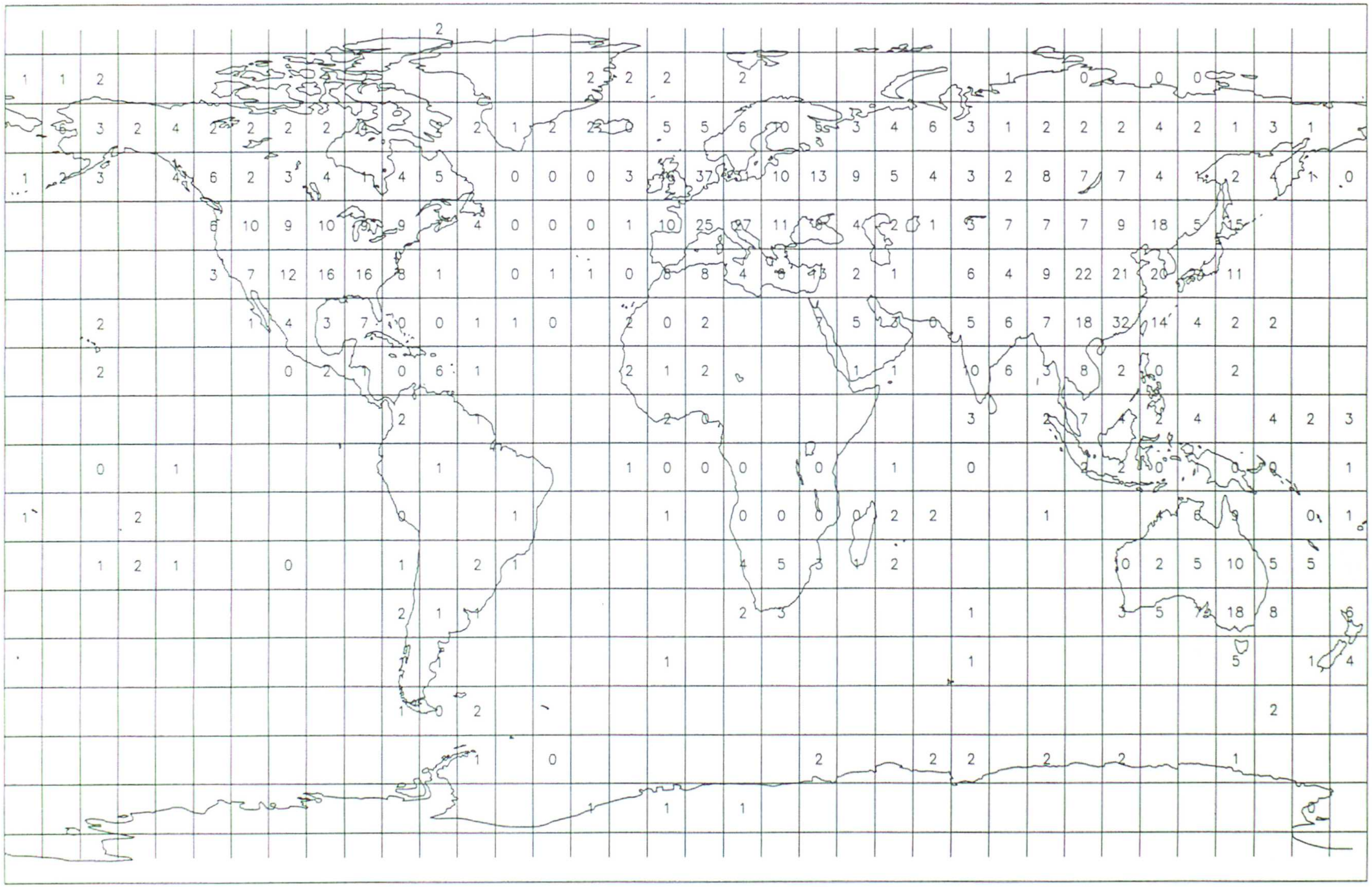

2
1 1 2 2 2 2 2 1 0 0 0
6 3 2 4 2 2 2 2 2 2 2 1 2 2 0 5 5 6 0 5 3 4 6 3 1 2 2 2 4 2 1 3 1
1 2 3 4 6 2 3 4 1 4 5 0 0 0 3 5 37 10 13 9 5 4 3 2 8 7 7 4 1 2 4 1 0
6 10 9 10 9 9 4 0 0 0 1 10 25 27 11 16 4 2 1 3 7 7 7 9 18 5 15
3 7 12 16 16 8 1 0 1 1 0 8 8 4 6 3 2 1 6 4 9 22 21 20 11
2 1 4 3 7 0 0 1 1 0 2 0 2 7 5 3 0 5 6 7 18 32 14 4 2 2
2 0 2 1 0 6 1 2 1 2 1 1 10 6 3 8 2 0 2
2 1 2 0 3 2 7 4 2 4 4 2 3
0 1 1 1 0 0 0 0 1 0 2 2 0 0 1
1 2 0 1 1 0 0 0 0 2 2 1 6 9 0 1
1 2 1 0 1 2 1 4 5 3 1 2 0 2 5 10 5 5
2 1 1 2 3 1 3 5 7 18 8 6
1 1 1 5 1 4
1 0 2 2
1 0 2 2 2 2 2 1
1 1 1

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from Bracknell global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
17240	00	DD	38/ 31	20	-10.1	8.3	21.9
25399	00	DD	66/-170	23	11.2	5.6	14.4
31510	00	DD	51/ 127	18	-10.4	4.4	10.2
42369	00	DD	27/ 81	7	17.4	6.8	21.7
42724	12	DD	24/ 91	17	-10.3	3.8	14.0
50527	12	DD	49/ 120	28	12.2	7.1	18.3
62337	00	DD	31/ 34	22	-15.9	4.5	8.7
76256	00	DD	28/-111	9	-12.2	9.4	25.5
76458	00	DD	23/-106	11	-20.2	7.8	11.4
78866	12	DD	18/ -63	25	-11.3	5.7	10.7
78988	12	DD	12/ -69	19	11.4	4.0	18.5
91334	00	DD	7/ 152	20	-26.1	7.2	22.7

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES, METEOSAT, GMS, INSAT.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

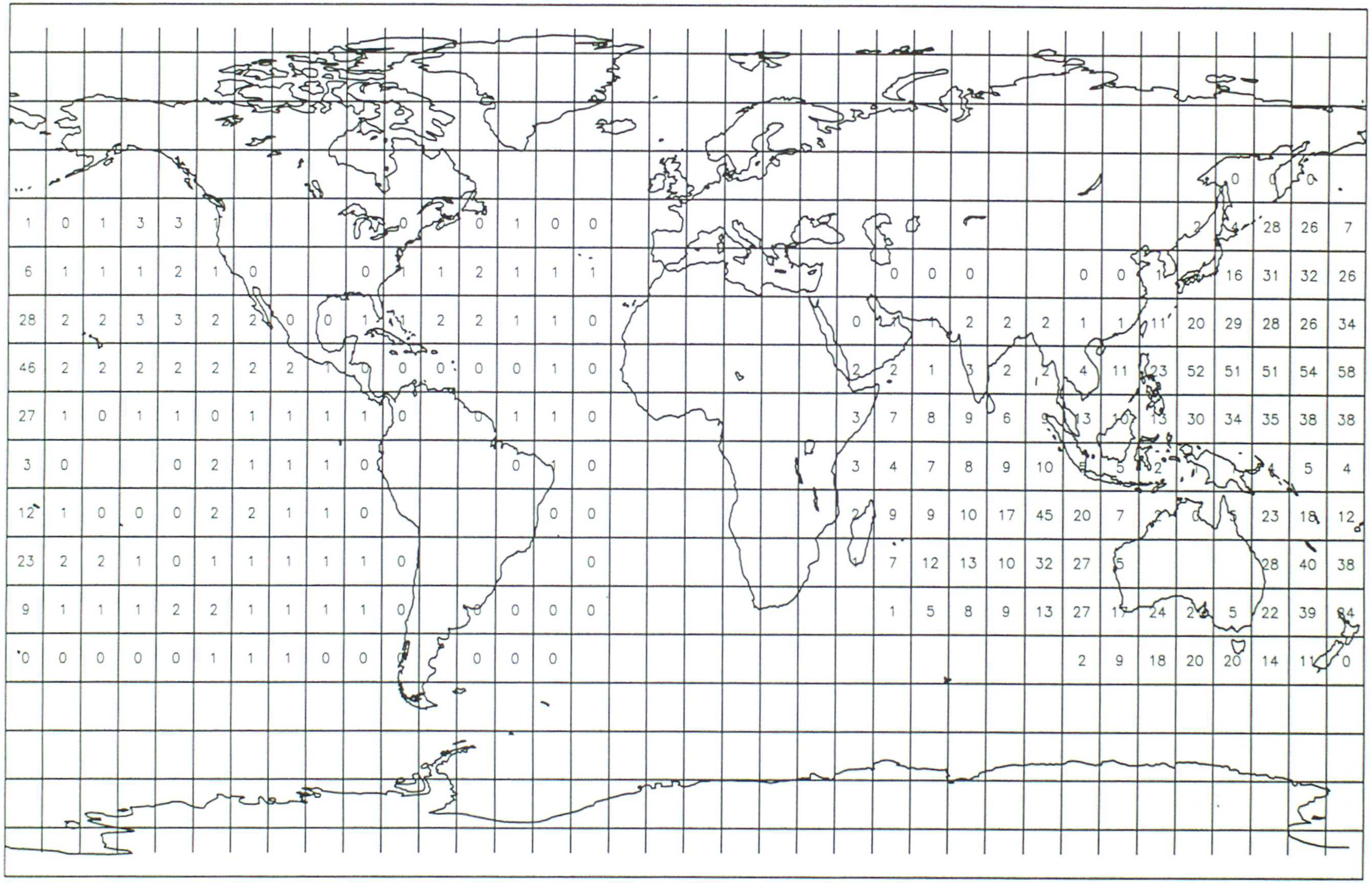
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

:RMS of observation minus background vector differences

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 701 AND 1000 HPA FIGURE 10
MARCH 1998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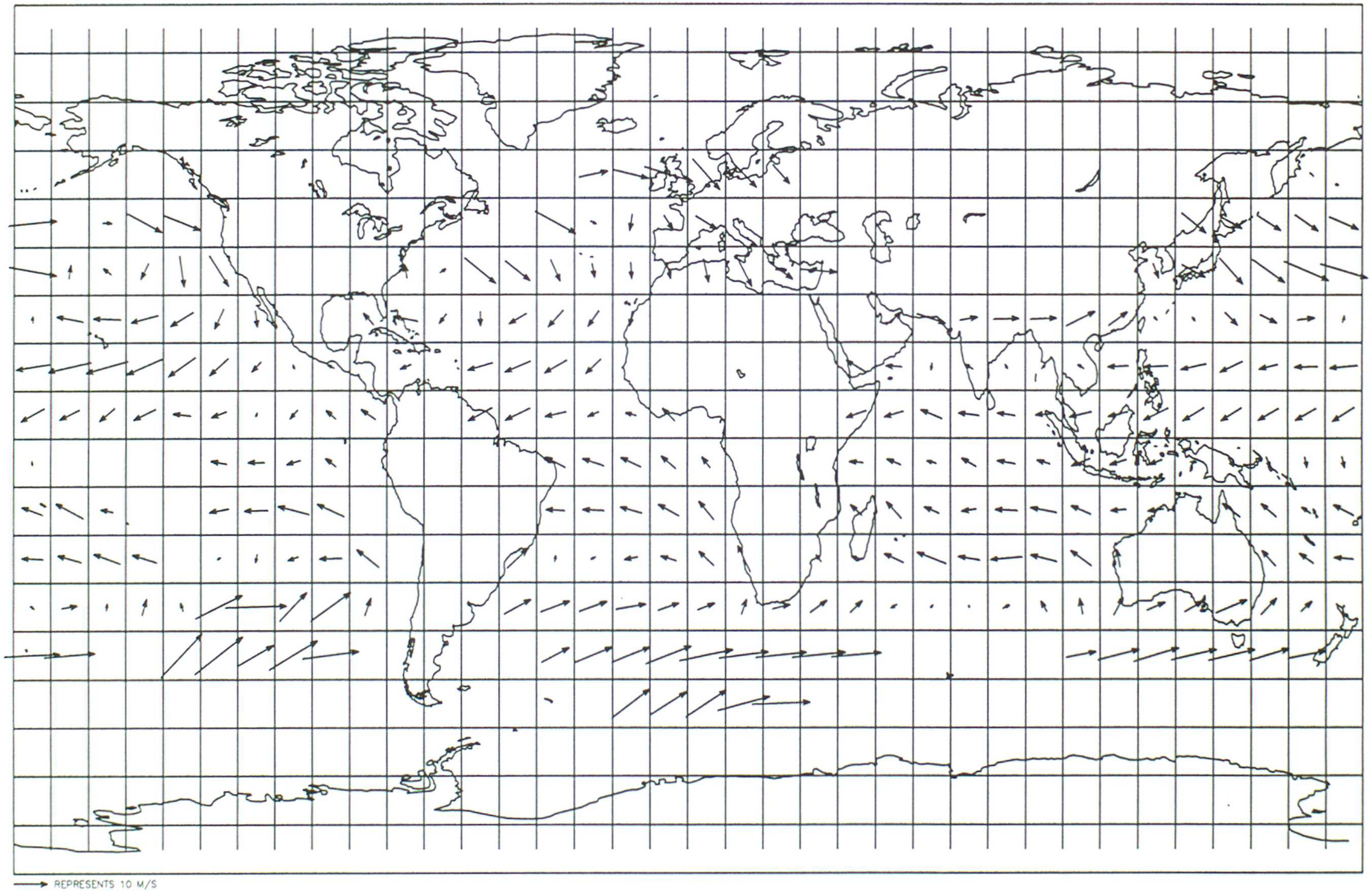
1 0 1 3 3 1 0 0 1 0 0 2 4 28 26 7
6 1 1 1 2 1 0 0 1 1 2 1 1 1 0 0 0 0 0 1 16 31 32 26
28 2 2 3 3 2 2 0 0 1 1 2 2 1 1 0 0 1 2 2 2 1 1 11 20 29 28 26 34
46 2 2 2 2 2 2 2 1 0 0 0 0 0 1 0 2 2 1 3 2 2 4 11 23 52 51 51 54 58
27 1 0 1 1 0 1 1 1 1 0 0 1 1 0 3 7 8 9 6 9 13 10 13 30 34 35 38 38
3 0 0 2 1 1 1 0 0 1 0 3 4 7 8 9 10 5 5 2 4 5 4
12 1 0 0 0 2 2 1 1 0 0 0 2 9 9 10 17 45 20 7 2 0 5 23 18 12
23 2 2 1 0 1 1 1 1 1 0 0 1 7 12 13 10 32 27 5 28 40 38
9 1 1 1 2 2 1 1 1 1 0 0 0 0 0 1 5 8 9 13 27 17 24 2 5 22 39 84
0 0 0 0 0 1 1 1 0 0 0 0 0 2 9 18 20 20 14 11 0

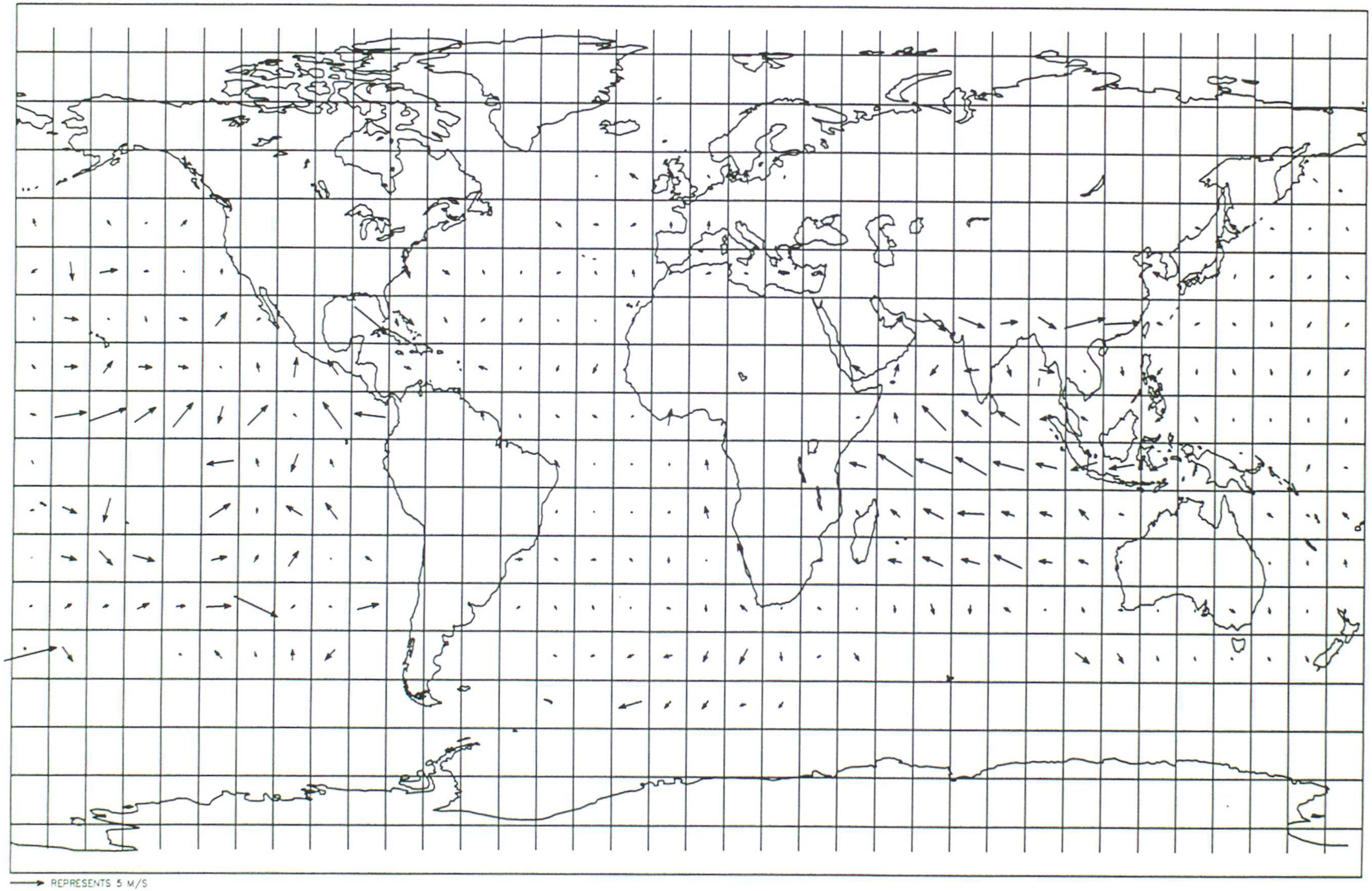
SATOB VECTOR MEAN WINDS BETWEEN 701–1000 HPA
MARCH 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 11

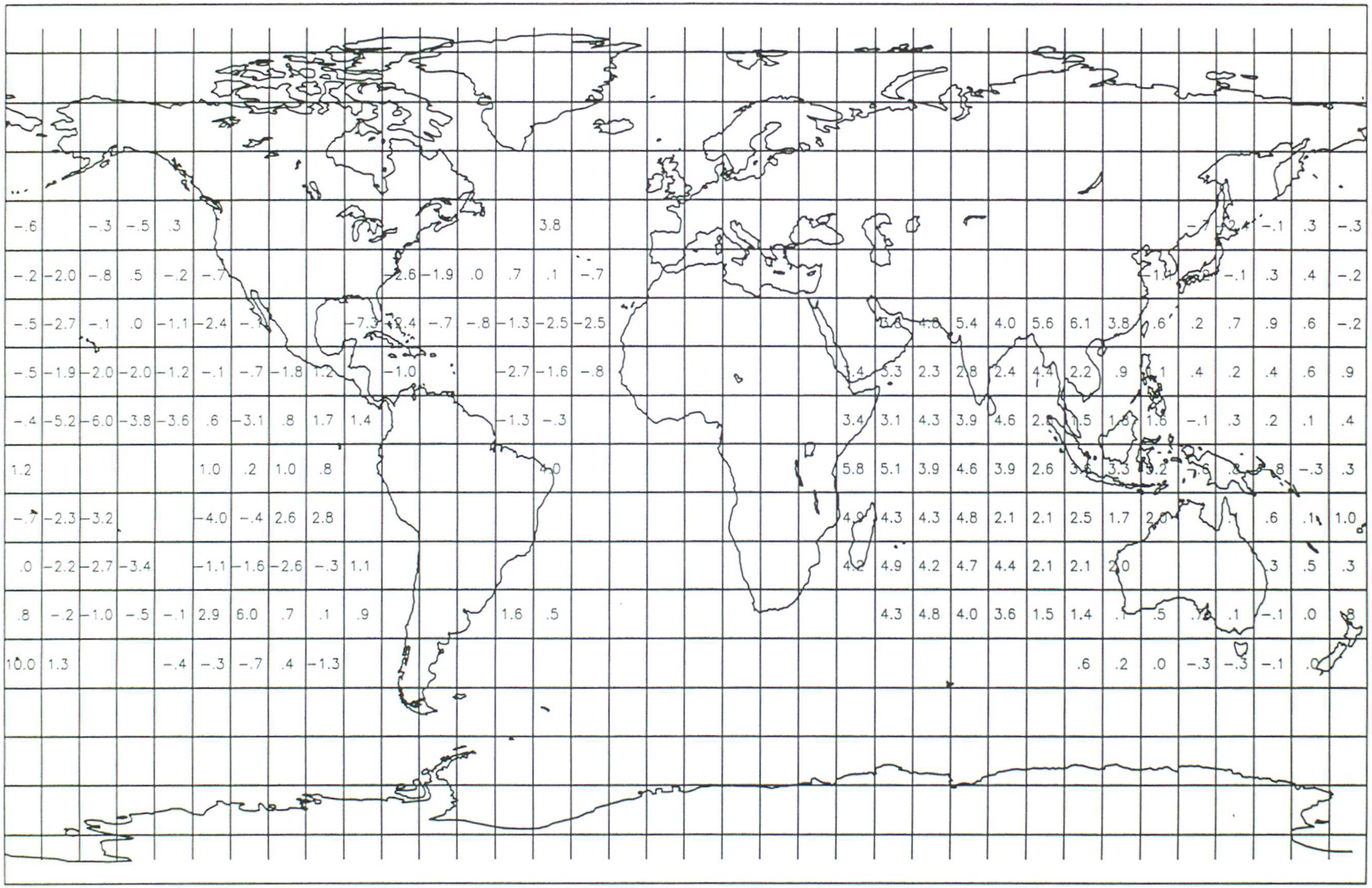

→ REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 701–1000 HPA
MARCH 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

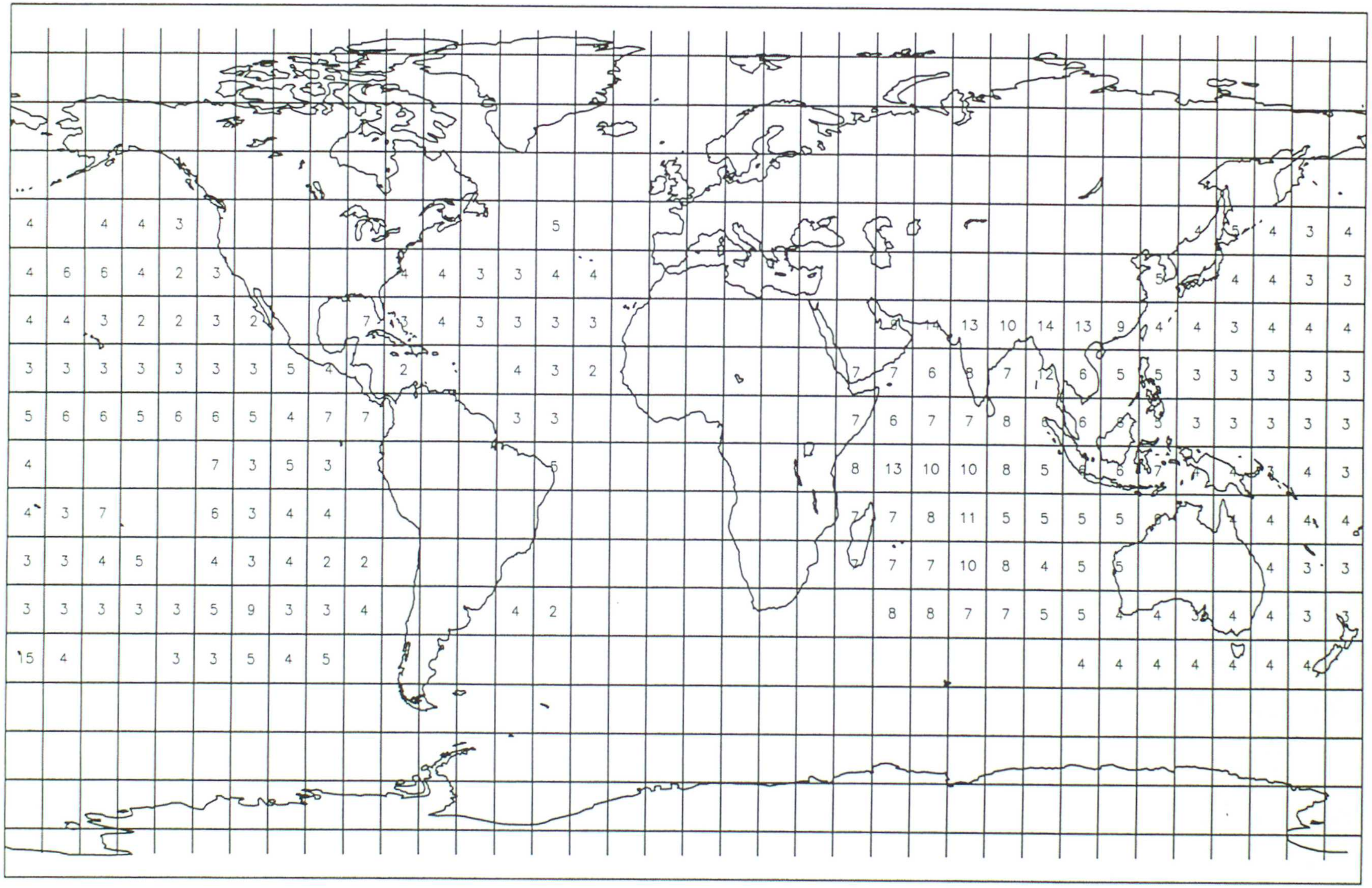
FIGURE 12



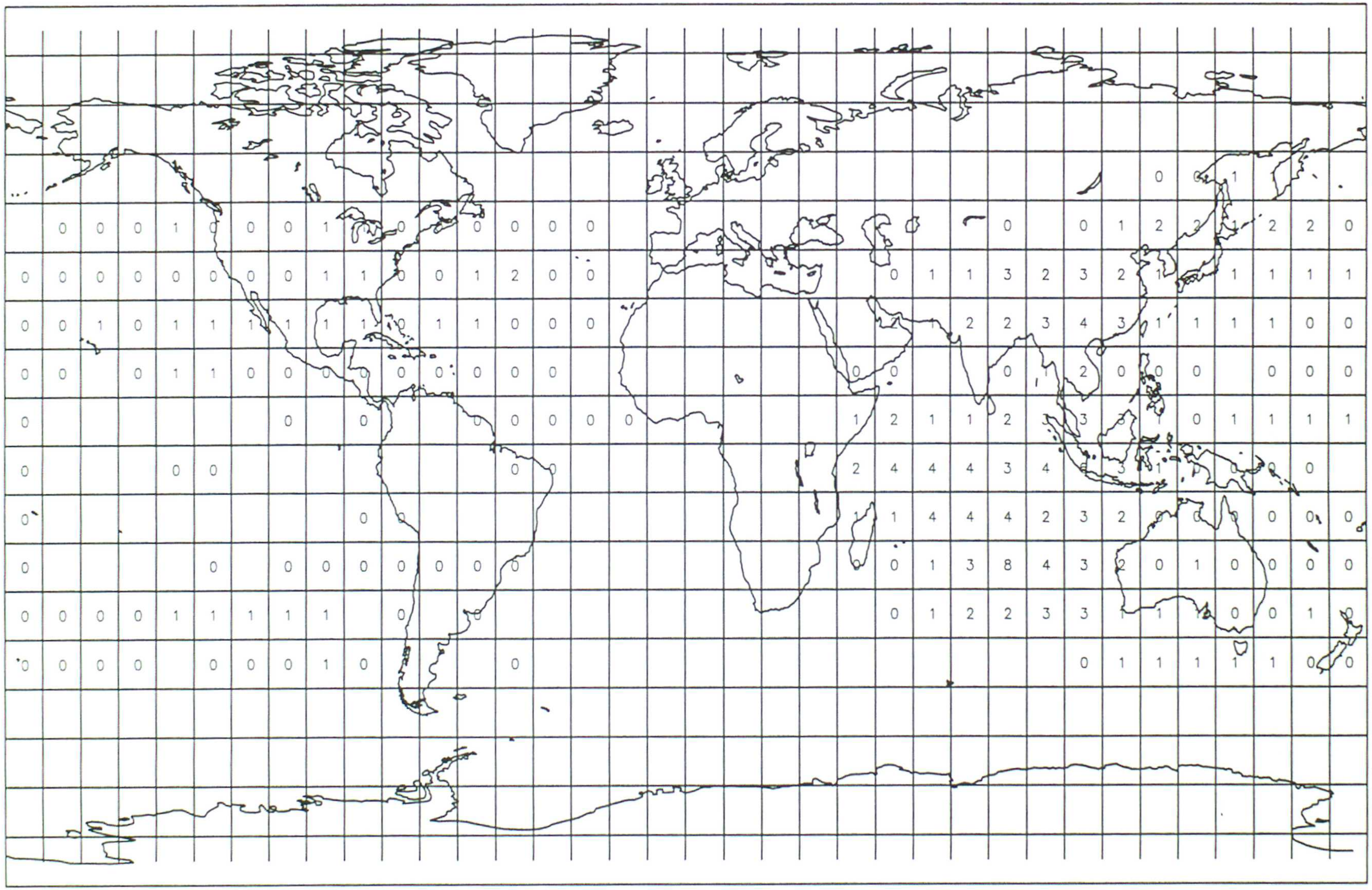
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 13
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-.6 -.3 -.5 .3 3.8 -.7 2.4 -.1 .3 -.3
-.2 -2.0 -.8 .5 -.2 -.7 -2.6 -1.9 .0 .7 .1 -.7 -1.1 .2 -.1 .3 .4 -.2
-.5 -2.7 -.1 .0 -1.1 -2.4 -.7 -7.3 -2.4 -.7 -.8 -1.3 -2.5 -2.5 3.6 4.8 5.4 4.0 5.6 6.1 3.8 .6 .2 .7 .9 .6 -.2
-.5 -1.9 -2.0 -2.0 -1.2 -.1 -.7 -1.8 1.2 -1.0 -2.7 -1.6 -.8 1.4 3.3 2.3 2.8 2.4 4.4 2.2 .9 .1 .4 .2 .4 .6 .9
-.4 -5.2 -6.0 -3.8 -3.6 .6 -3.1 .8 1.7 1.4 -1.3 -.3 3.4 3.1 4.3 3.9 4.6 2.8 1.5 1.8 1.6 -.1 .3 .2 .1 .4
1.2 1.0 .2 1.0 .8 4.0 5.8 5.1 3.9 4.6 3.9 2.6 3.6 3.3 3.2 .6 .8 .8 -.3 .3
-.7 -2.3 -3.2 -4.0 -.4 2.6 2.8 4.9 4.3 4.3 4.8 2.1 2.1 2.5 1.7 2.0 .6 .1 1.0
.0 -2.2 -2.7 -3.4 -1.1 -1.6 -2.6 -.3 1.1 4.2 4.9 4.2 4.7 4.4 2.1 2.1 2.0 .3 .5 .3
.8 -.2 -1.0 -.5 -.1 2.9 6.0 .7 .1 .9 1.6 .5 4.3 4.8 4.0 3.6 1.5 1.4 .1 .5 .7 .1 -.1 .0 .8
10.0 1.3 -.4 -.3 -.7 .4 -1.3 .6 .2 .0 -.3 -.3 -.1 .0

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 701 AND 1000 HPA FIGURE 14
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


4 4 4 3 5 4 5 4 3 4
4 6 6 4 2 3 4 4 3 3 4 4 5 4 4 3 3
4 4 3 2 2 3 2 7 3 4 3 3 3 3 8 14 13 10 14 13 9 4 4 3 4 4 4
3 3 3 3 3 3 3 5 4 2 4 3 2 7 7 6 8 7 12 6 5 5 3 3 3 3 3
5 6 6 5 6 6 5 4 7 7 3 3 7 6 7 7 8 6 6 8 5 3 3 3 3 3
4 7 3 5 3 5 8 13 10 10 8 5 6 6 7 4 4 3 4 3
4 3 7 6 3 4 4 7 7 8 11 5 5 5 5 8 4 4 4 4
3 3 4 5 4 3 4 2 2 7 7 7 10 8 4 5 5 4 3 3
3 3 3 3 3 5 9 3 3 4 4 2 8 8 7 7 5 5 4 4 3 4 4 3 3
15 4 3 3 5 4 5 4 4 4 4 4 4 4

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 401 AND 700 HPA FIGURE 15
MARCH 1998


0 0 1
0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 1 2 2 1 2 2 0
0 0 0 0 0 0 0 0 1 1 0 0 1 2 0 0 0 1 1 3 2 3 2 1 1 1 1 1
0 0 1 0 1 1 1 1 1 1 0 1 1 0 0 0 1 1 2 2 3 4 3 1 1 1 1 0 0
0 0 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 1 2 0 0 0 0 0 0
0 0 0 0 0 0 0 0 1 2 1 1 2 3 3 3 1 0 1 1 1 1
0 0 0 0 0 2 4 4 4 3 4 3 3 1 0 0 0 0
0 0 0 1 1 4 4 4 2 3 2 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 1 3 8 4 3 2 0 1 0 0 0 0
0 0 0 0 1 1 1 1 1 0 0 0 1 2 2 3 3 1 1 1 0 0 1 0
0 0 0 0 0 0 0 1 0 0 0 1 1 1 1 1 0 0

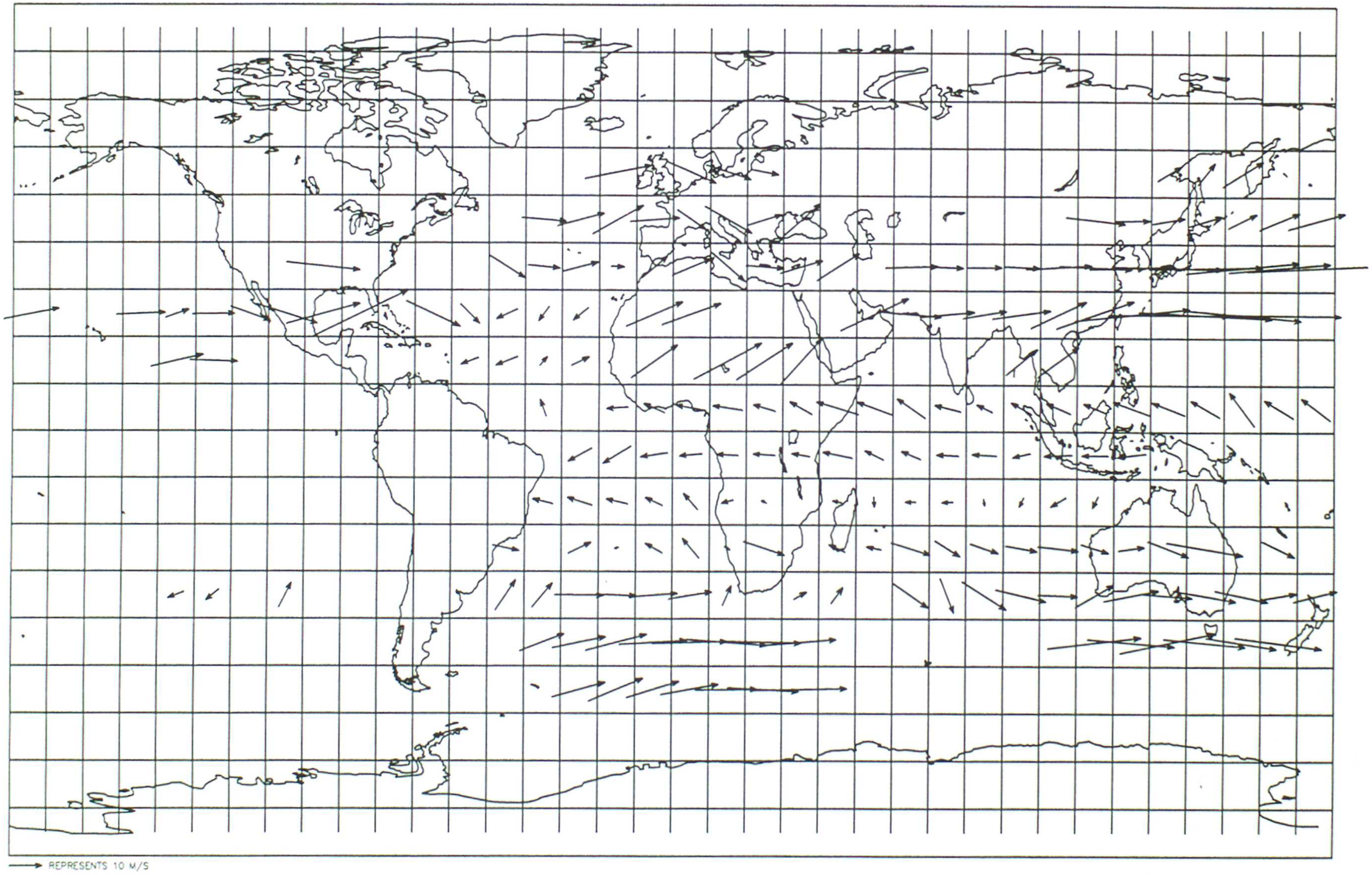
SATOB VECTOR MEAN WINDS BETWEEN 401–700 HPA

MARCH 1998

ALL OBSERVATIONS

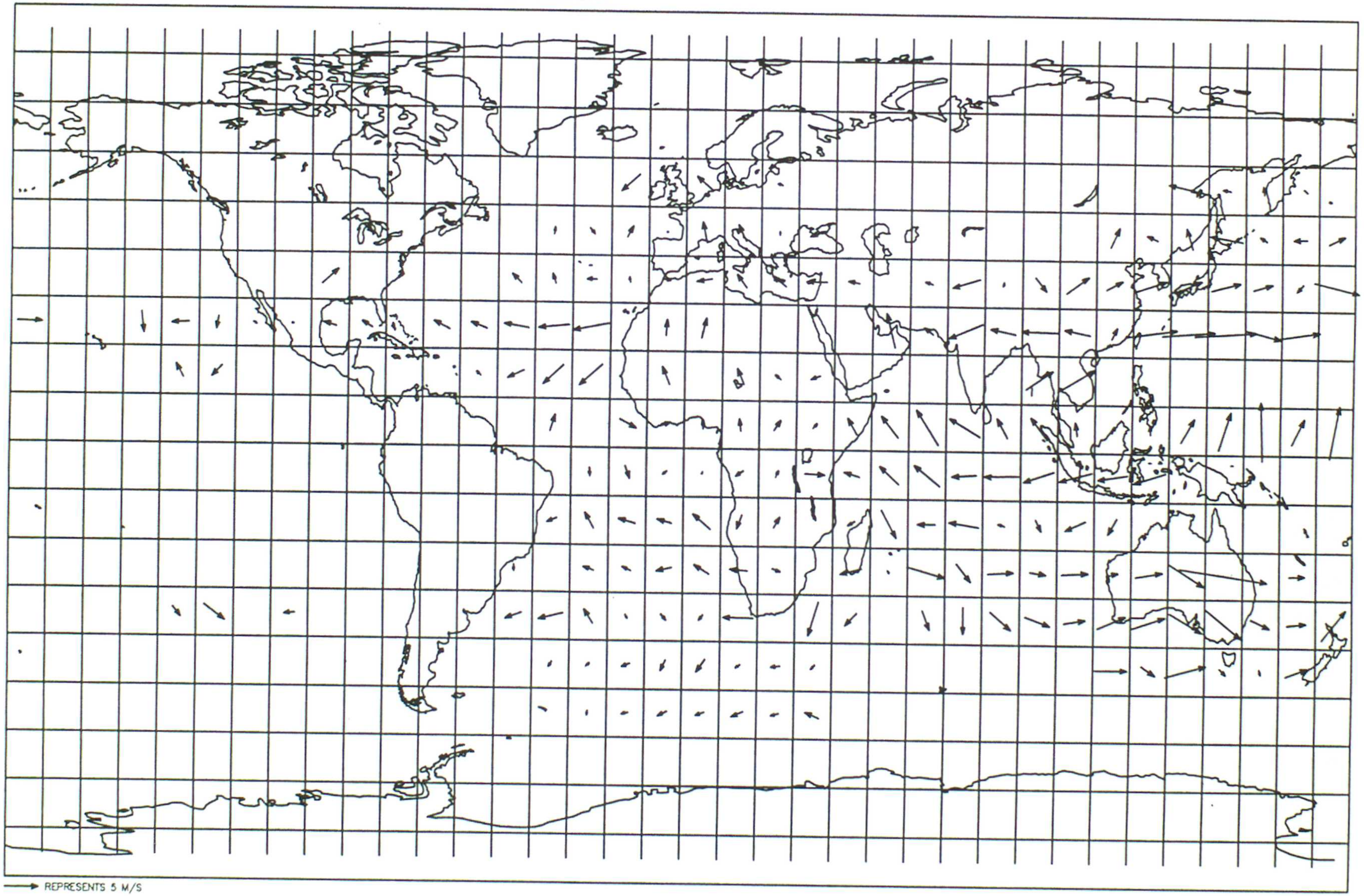
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

FIGURE 16

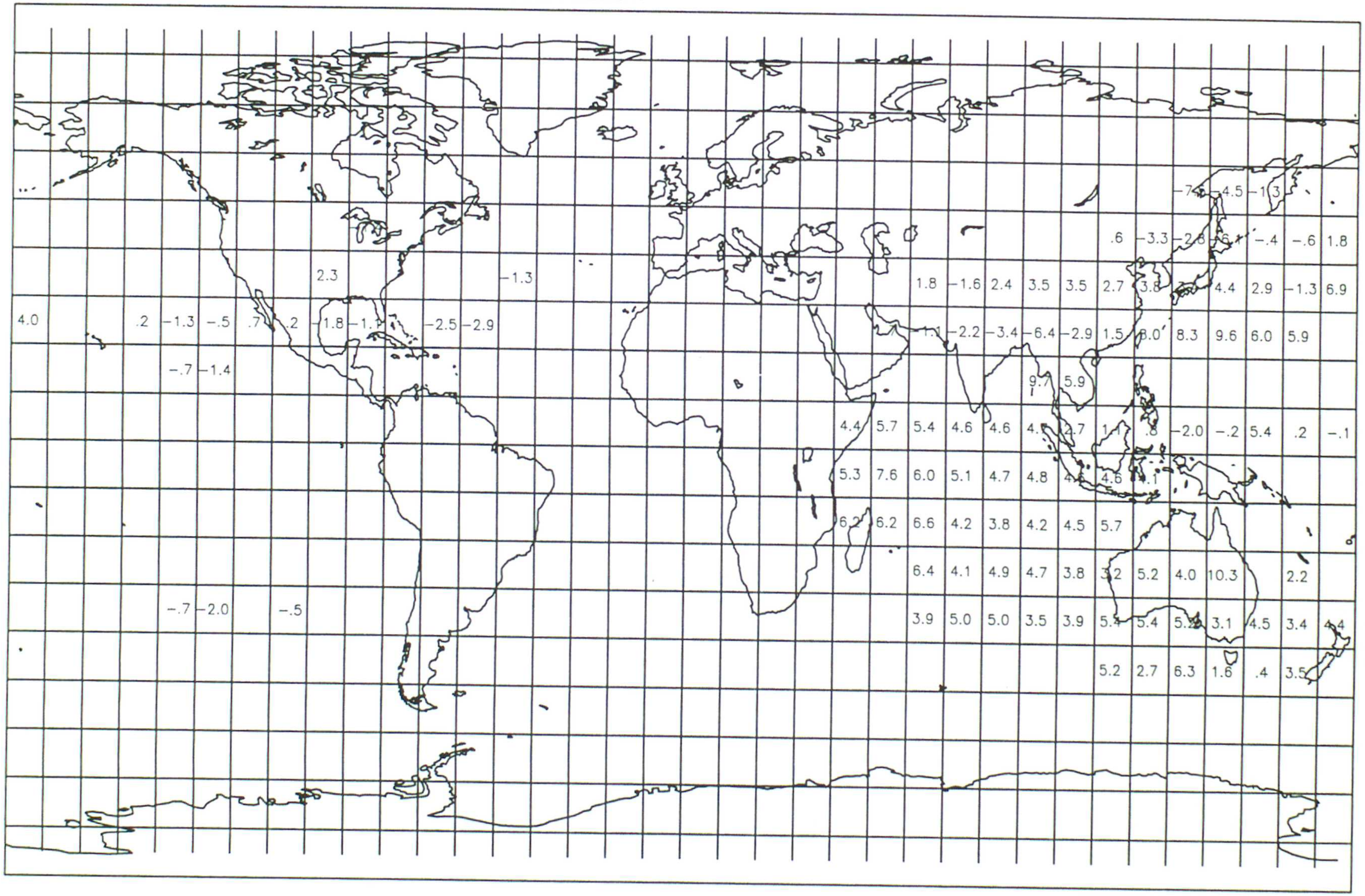

REPRESENTS 10 M/S

SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 401-700 HPA
MARCH 1998
ALL OBSERVATIONS
ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

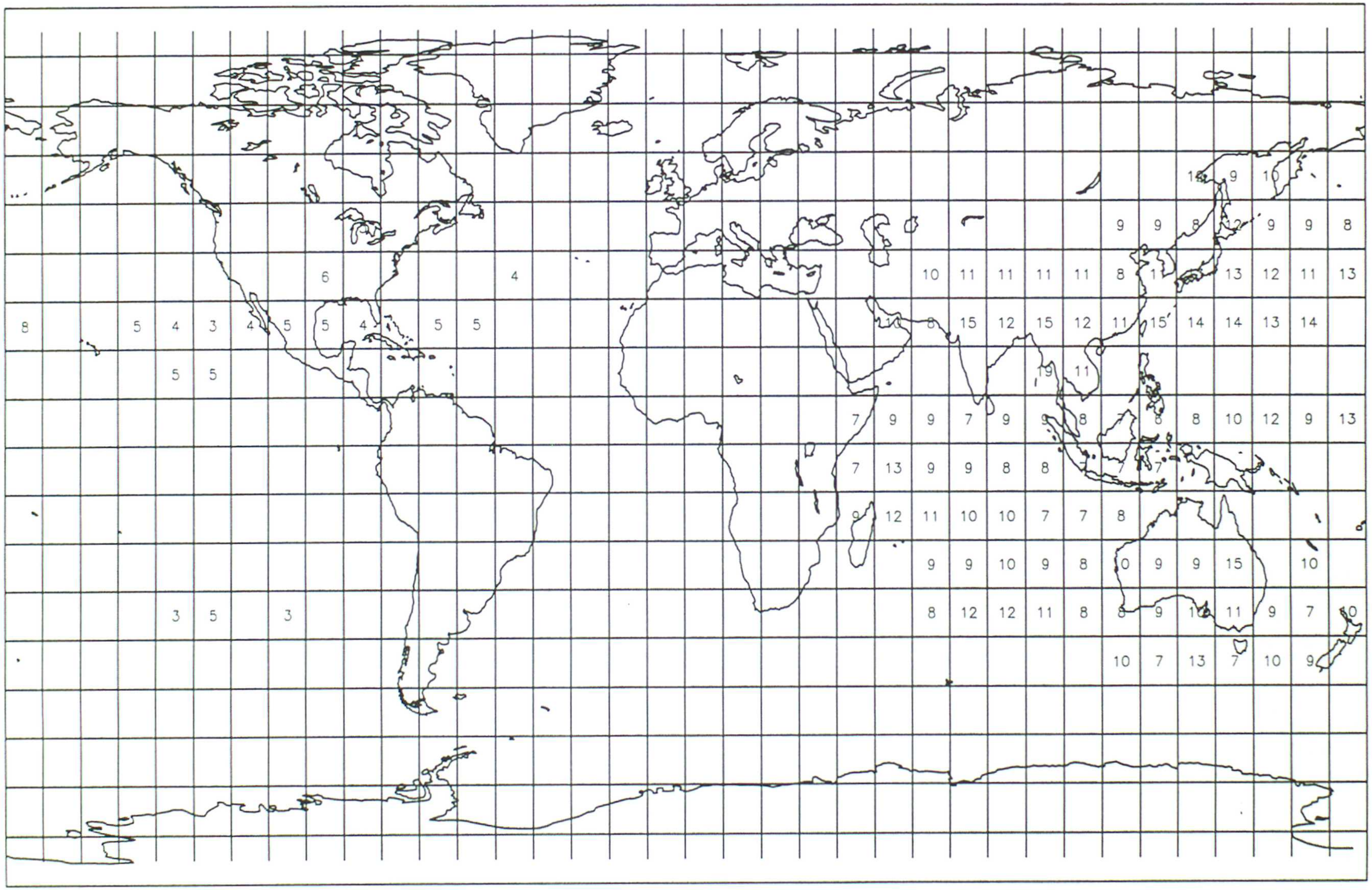
FIGURE 17


REPRESENTS 5 M/S

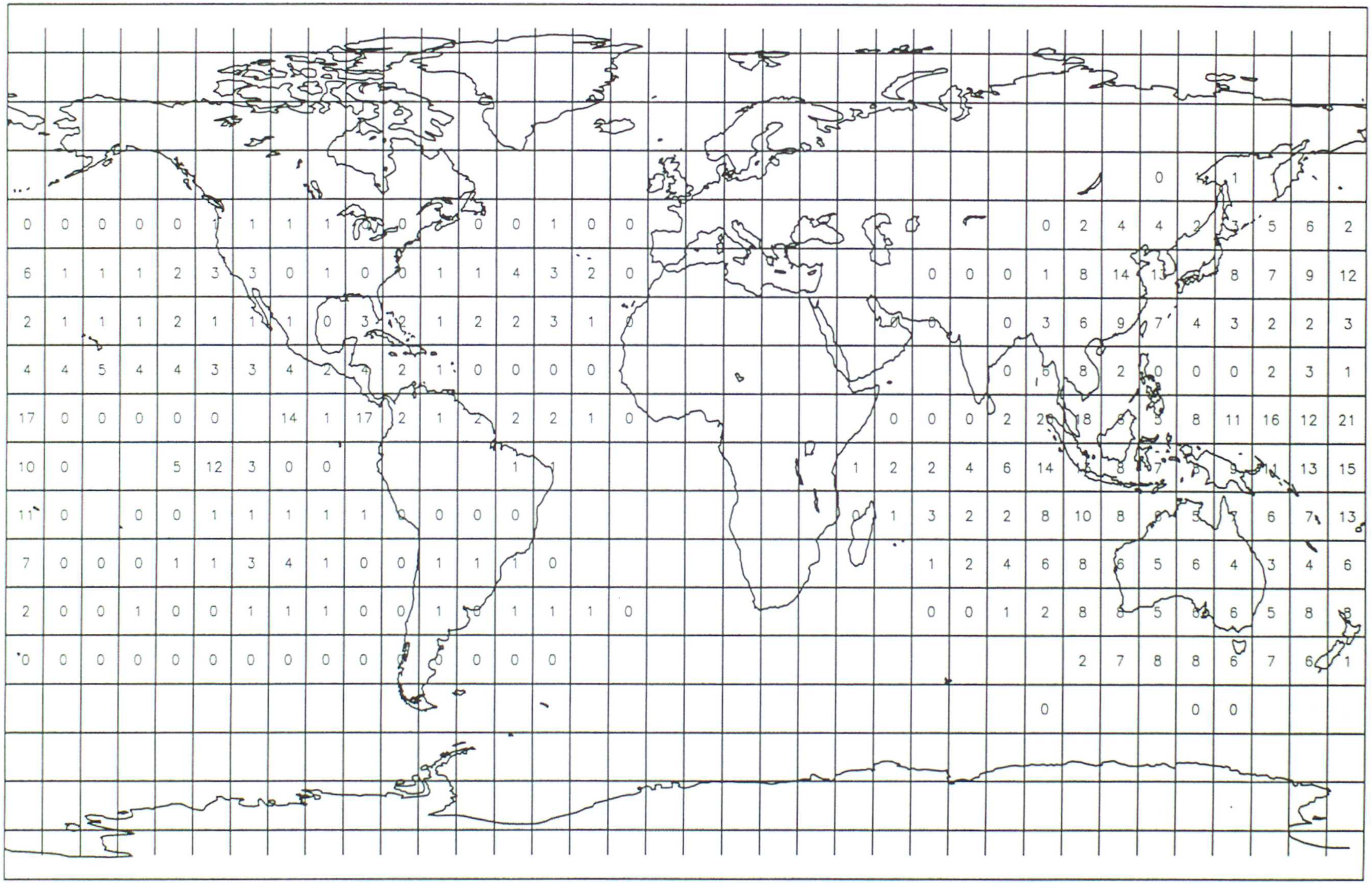
SATOBS : MEAN O-B SPEED DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 18
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-7 -4.5 -1.3
.6 -3.3 -2.8 6.1 -.4 -.6 1.8
2.3 -1.3 1.8 -1.6 2.4 3.5 3.5 2.7 3.8 4.4 2.9 -1.3 6.9
4.0 .2 -1.3 -.5 .7 .2 -1.8 -1.1 -2.5 -2.9 -1.1 -2.2 -3.4 -6.4 -2.9 1.5 8.0 8.3 9.6 6.0 5.9
-.7 -1.4 9.7 5.9
4.4 5.7 5.4 4.6 4.6 4.5 2.7 1.1 .8 -2.0 -.2 5.4 .2 -.1
5.3 7.6 6.0 5.1 4.7 4.8 4.6 4.6 4.1
6.2 6.2 6.6 4.2 3.8 4.2 4.5 5.7
6.4 4.1 4.9 4.7 3.8 3.2 5.2 4.0 10.3 2.2
-.7 -2.0 -.5 3.9 5.0 5.0 3.5 3.9 5.4 5.4 5.2 3.1 4.5 3.4 4.4
5.2 2.7 6.3 1.6 .4 3.5

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 401 AND 700 HPA FIGURE 19
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


14 9 10
9 9 8 12 9 9 8
6 4 10 11 11 11 11 8 1 13 12 11 13
8 5 4 3 4 5 5 4 5 5 16 8 15 12 15 12 11 15 14 14 13 14
5 5 19 11
7 9 9 7 9 9 8 7 8 8 10 12 9 13
7 13 9 9 8 8 7
9 12 11 10 10 7 7 8
9 9 10 9 8 0 9 9 15 10
3 5 3 8 12 12 11 8 8 9 10 11 9 7 10
10 7 13 7 10 9

AVERAGE DAILY NUMBER OF SATOB OBSERVATIONS BETWEEN 101 AND 400 HPA FIGURE 20
MARCH 1998


0 1
0 0 0 0 0 1 1 1 1 0 0 0 0 1 0 0 0 2 4 4 2 3 5 6 2
6 1 1 1 2 3 3 0 1 0 0 1 1 4 3 2 0 0 0 0 1 8 14 13 8 7 9 12
2 1 1 1 2 1 1 1 0 3 2 1 2 2 3 1 0 0 0 0 3 6 9 7 4 3 2 2 3
4 4 5 4 4 3 3 4 2 4 2 1 0 0 0 0 0 6 8 2 0 0 0 2 3 1
17 0 0 0 0 0 14 1 17 2 1 2 2 2 1 0 0 0 0 2 20 18 8 5 8 11 16 12 21
10 0 5 12 3 0 0 1 1 1 2 2 4 6 14 15 8 7 8 9 11 13 15
11 0 0 0 1 1 1 1 1 0 0 0 0 0 1 3 2 2 8 10 8 8 5 7 6 7 13
7 0 0 0 1 1 3 4 1 0 0 1 1 1 0 1 2 4 6 8 6 5 6 4 3 4 6
2 0 0 1 0 0 1 1 1 0 0 1 0 1 1 1 0 0 0 1 2 8 8 5 6 6 5 8 8
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 2 7 8 8 6 7 6 1
0 0 0

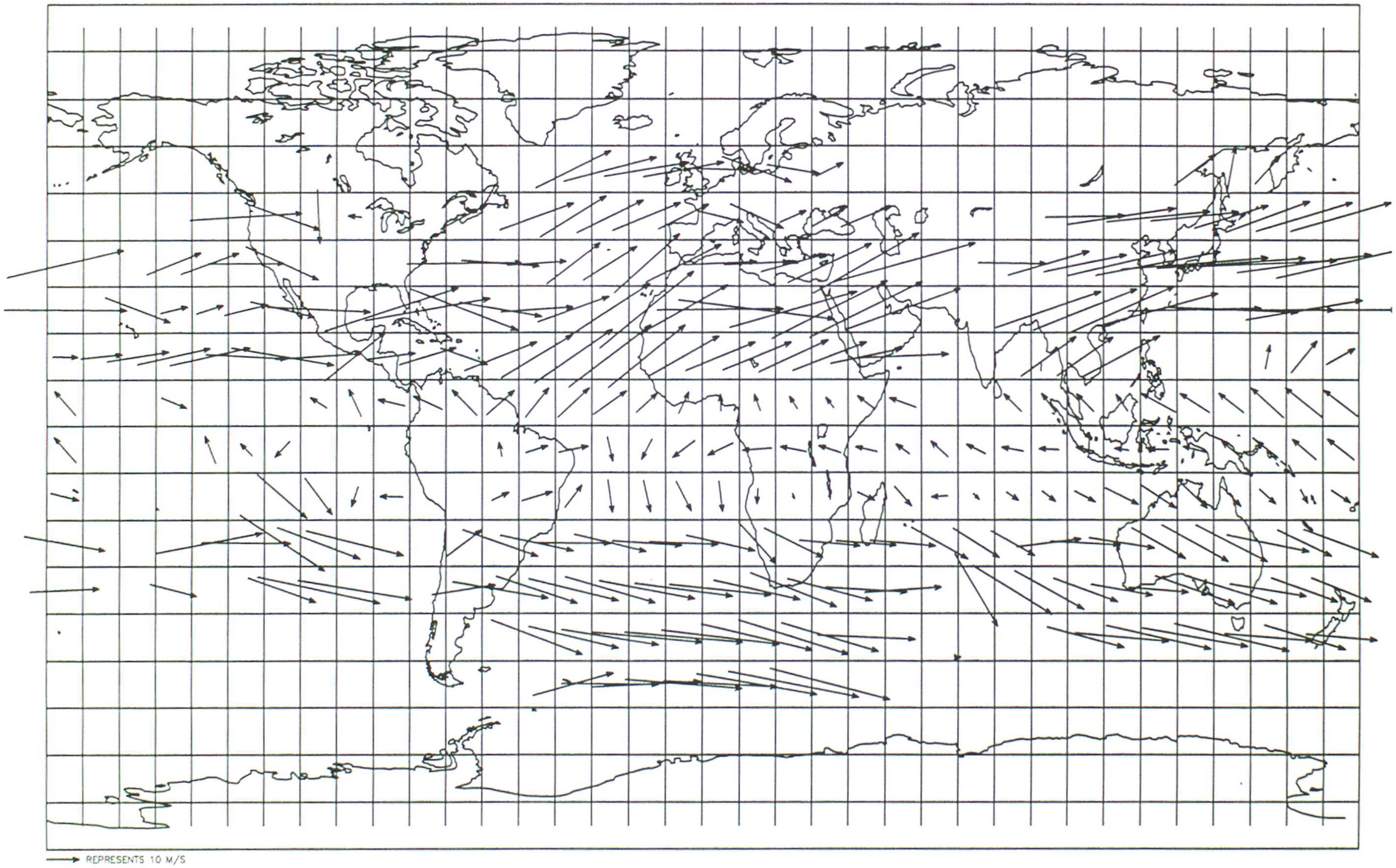
SATOB VECTOR MEAN WINDS BETWEEN 101–400 HPA

FIGURE 21

MARCH 1998

ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT


REPRESENTS 10 M/S

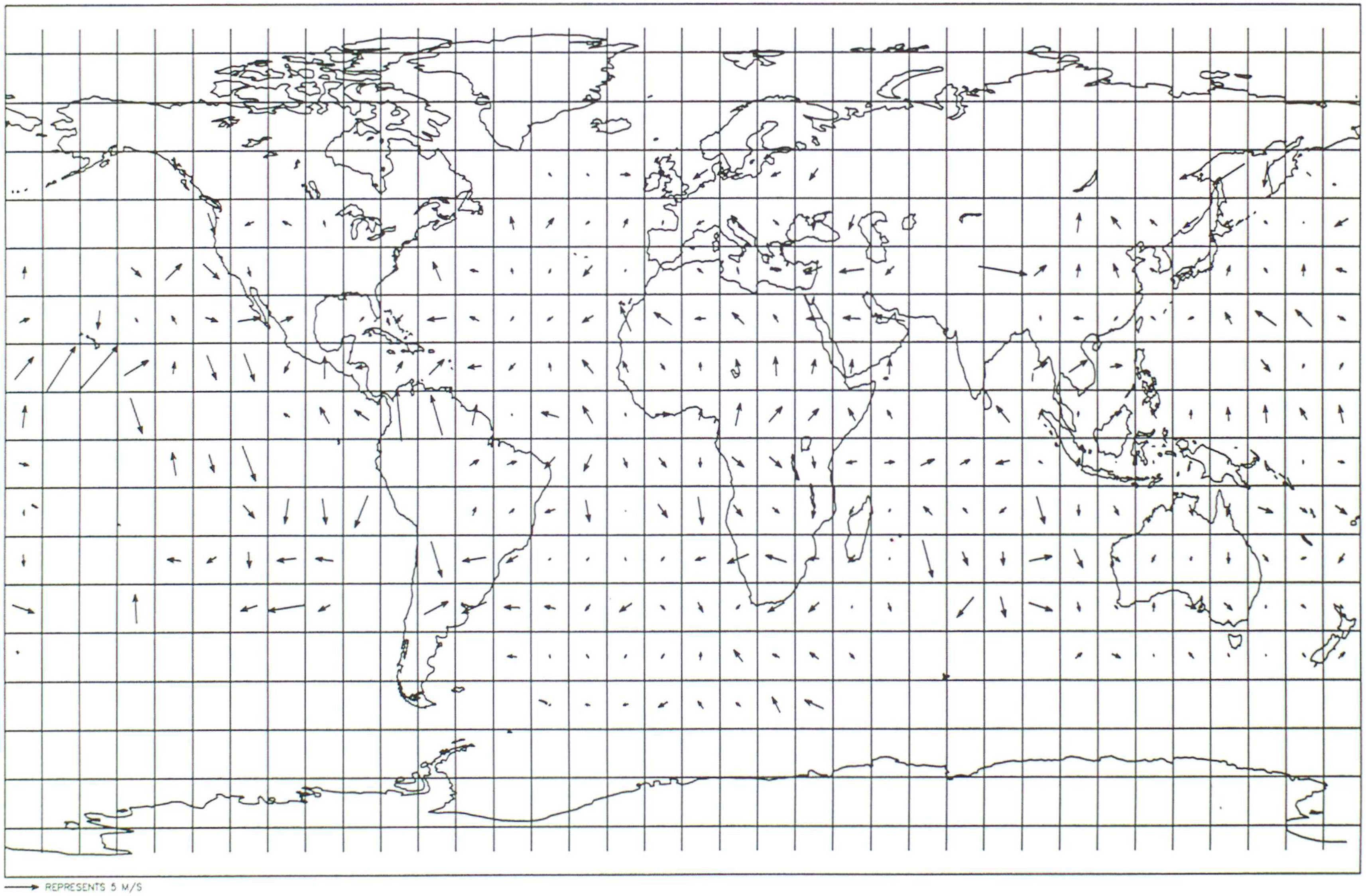
SATOB O-B VECTOR WIND DIFFERENCES BETWEEN 101-400 HPA

MARCH 1998

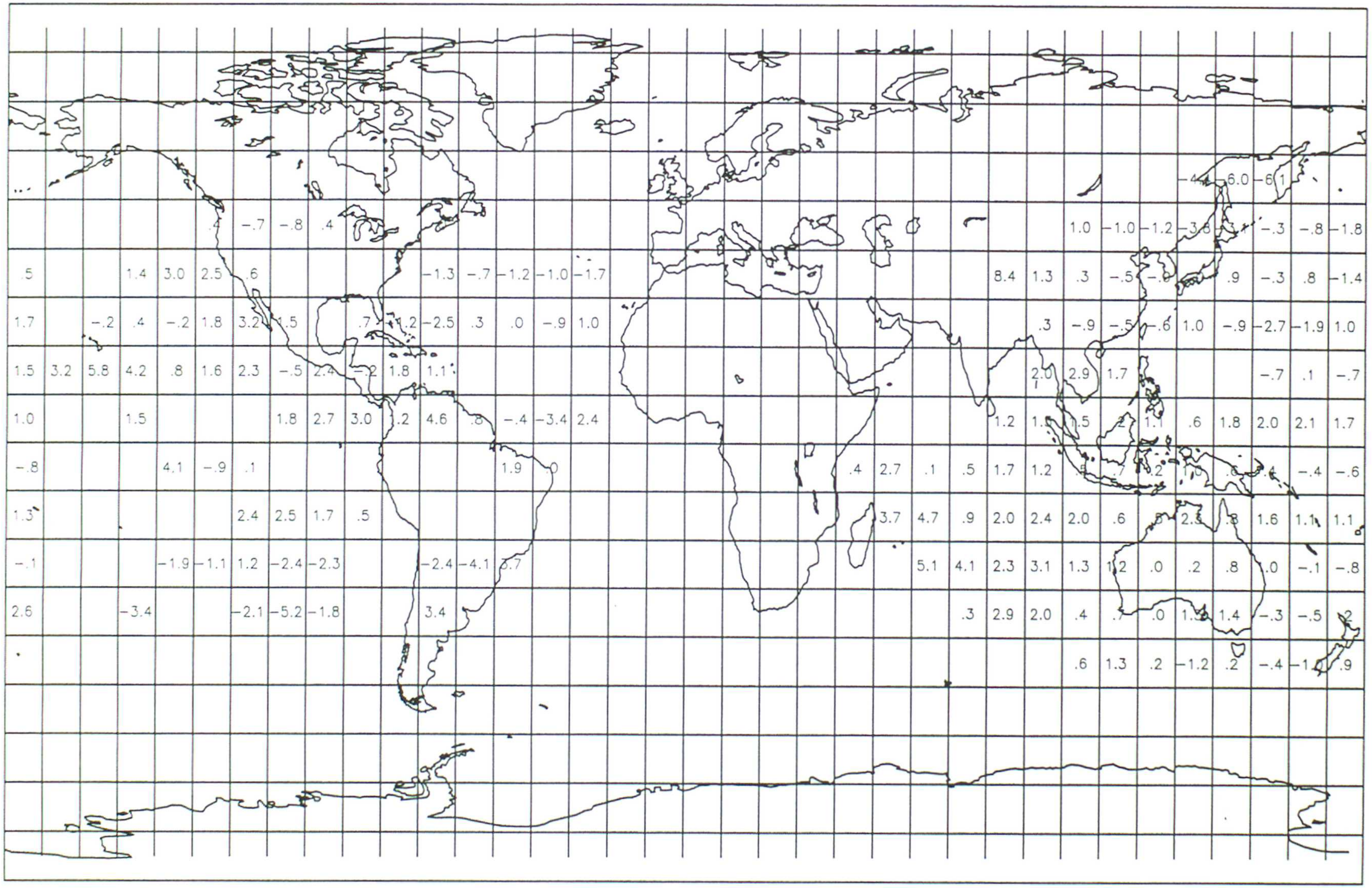
ALL OBSERVATIONS

ARROWS PLOTTED WHERE MORE THAN 10 OBS ARE PRESENT

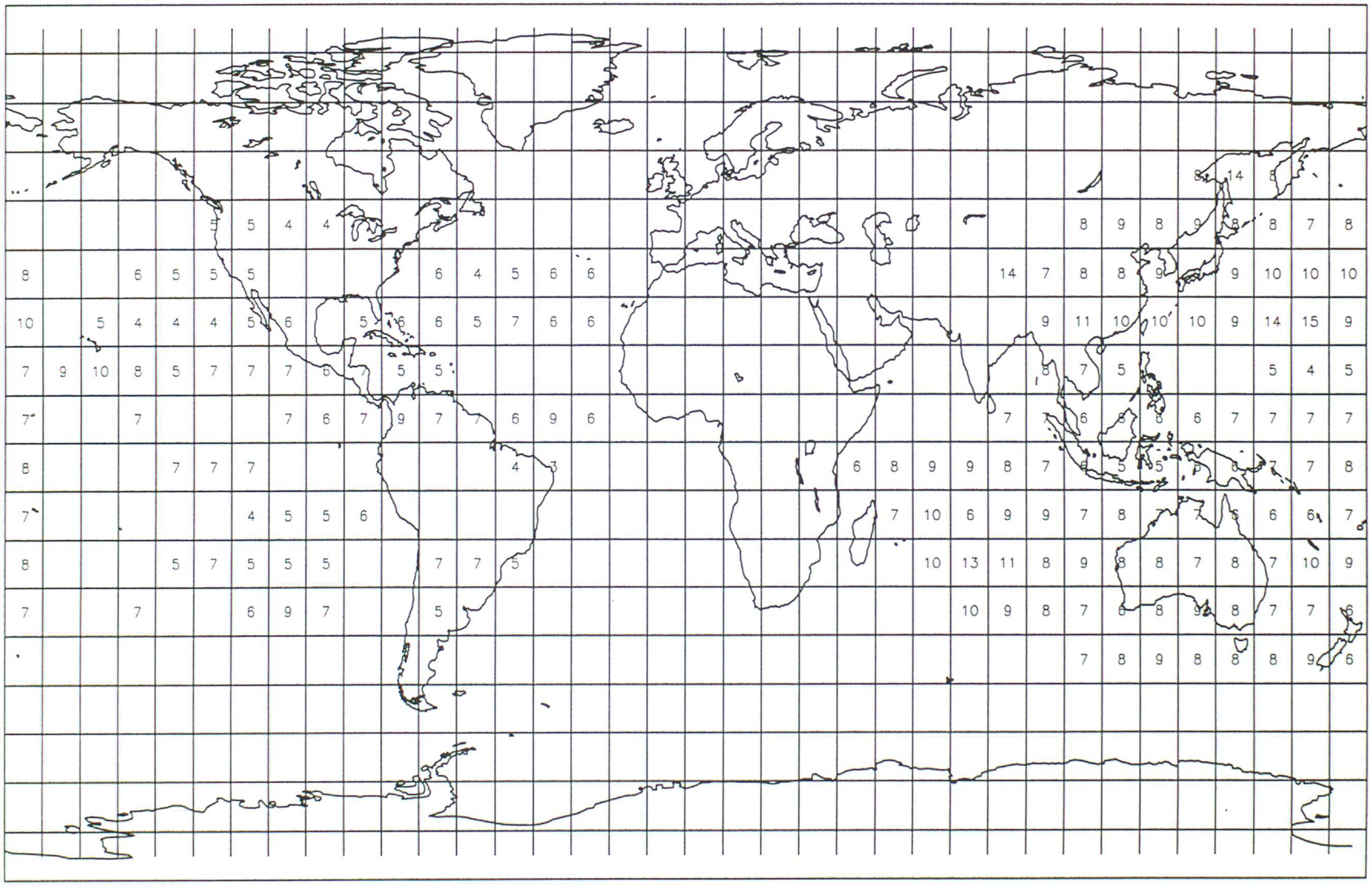
FIGURE 22


REPRESENTS 5 M/S

SATOBS : MEAN O–B SPEED DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 23
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


-4.4 -6.0 -6.1
.4 -.7 -.8 .4 1.0 -1.0 -1.2 -3.8 -.3 -.8 -1.8
.5 1.4 3.0 2.5 .6 -1.3 -.7 -1.2 -1.0 -1.7 8.4 1.3 .3 -.5 -.6 .9 -.3 .8 -1.4
1.7 -.2 .4 -.2 1.8 3.2 1.5 .7 -1.2 -2.5 .3 .0 -.9 1.0 .3 -.9 -.5 -.6 1.0 -.9 -2.7 -1.9 1.0
1.5 3.2 5.8 4.2 .8 1.6 2.3 -.5 2.4 -.2 1.8 1.1 2.0 2.9 1.7 -.7 .1 -.7
1.0 1.5 1.8 2.7 3.0 1.2 4.6 .8 -.4 -3.4 2.4 1.2 1.5 1.5 .2 1.1 .6 1.8 2.0 2.1 1.7
-.8 4.1 -.9 .1 1.9 .0 .4 2.7 .1 .5 1.7 1.2 .5 .7 .2 1.0 .6 .4 -.4 -.6
1.3 2.4 2.5 1.7 .5 3.7 4.7 .9 2.0 2.4 2.0 .6 .5 2.3 .8 1.6 1.1 1.1
-.1 -1.9 -1.1 1.2 -2.4 -2.3 -2.4 -4.1 3.7 5.1 4.1 2.3 3.1 1.3 1.2 .0 .2 .8 1.0 -.1 -.8
2.6 -3.4 -2.1 -5.2 -1.8 3.4 .3 2.9 2.0 .4 .7 .0 1.3 1.4 -.3 -.5 .2
.6 1.3 .2 -1.2 .2 -.4 -1.0 .9

SATOBS : RMS O-B VECTOR DIFFERENCES (M/S) BETWEEN 101 AND 400 HPA FIGURE 24
MARCH 1998
USING ALL OBSERVATIONS
VALUES ARE PRINTED WHERE MORE THAN 10 OBS ARE PRESENT


8 14 8
5 5 4 4 8 9 8 9 8 8 7 8
8 6 5 5 5 6 4 5 6 6 14 7 8 8 9 9 10 10 10
10 5 4 4 4 5 6 5 6 6 5 7 6 6 9 11 10 10 10 9 14 15 9
7 9 10 8 5 7 7 7 6 7 5 5 8 7 5 5 4 5
7 7 7 6 7 9 7 7 6 9 6 7 7 6 8 6 7 7 7 7
8 7 7 7 4 3 6 8 9 9 8 7 8 5 5 6 7 7 8
7 4 5 5 6 7 10 6 9 9 7 8 7 6 6 6 7
8 5 7 5 5 5 7 7 5 10 13 11 8 9 8 8 7 8 7 10 9
7 7 6 9 7 5 10 9 8 7 6 8 9 8 7 7 6
7 8 9 8 8 8 9 6

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-11, NOAA-14 500 km.

Standard of comparison :Background field from Bracknell global model.

Selection Criteria :All SATEM soundings where number of observations > 30.

Data Extracted :Layer: 850 - 1000 hPa
100 - 300 hPa
30 - 50 hPa

:Mean observation minus background temperature differences

NO DATA AVAILABLE

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored
:Mean sea-level pressure (hPa)
:Wind speed (m s^{-1})
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS
:15 hPa (pressure)
:25 m s^{-1} (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
13903	24.9	-43.6	ALL	P	SUR	273	0	0	0.9	1.1	1.4
13906	26.9	-56.2	ALL	P	SUR	283	0	0	1.1	0.0	1.1
13912	18.1	-64.3	ALL	P	SUR	266	0	0	1.3	0.6	1.4
13913	18.8	-53.8	ALL	P	SUR	268	0	0	1.2	0.0	1.2
29803	36.1	-62.2	ALL	P	SUR	8	0	0	1.8	-0.9	2.0
41506	16.0	-61.0	ALL	P	SUR	378	8	2	1.7	0.7	1.8
41524	15.6	-56.9	ALL	P	SUR	455	0	0	1.0	0.6	1.2
41610	44.6	-12.5	ALL	P	SUR	1	0	0	0.0	1.5	1.5
41924	22.4	-43.8	ALL	P	SUR	280	0	0	1.0	-2.0	2.2
42730029	54.0	-8.8	ALL	P	SUR	17	2	12	5.6	2.4	6.1
44609	55.5	-21.7	ALL	P	SUR	1060	1	0	1.8	0.6	1.9
44614	55.7	-37.1	ALL	P	SUR	1233	6	0	2.0	0.2	2.0
44616	51.5	-28.9	ALL	P	SUR	1028	11	1	1.7	0.1	1.7
44617	52.0	-29.1	ALL	P	SUR	1010	6	1	1.7	-0.1	1.7
44621	58.1	-9.5	ALL	P	SUR	935	5	1	1.8	-0.1	1.8
44624	61.4	-9.1	ALL	P	SUR	1207	6	0	1.6	0.1	1.6
44727	56.5	-26.8	ALL	P	SUR	1891	11	1	2.2	-0.4	2.2
44728	63.0	-27.0	ALL	P	SUR	330	2	1	1.3	0.2	1.3
44760	33.3	-35.1	ALL	P	SUR	150	0	0	1.1	-0.5	1.2
44761	56.3	-37.2	ALL	P	SUR	902	3	0	2.3	0.4	2.3
44762	39.3	-10.1	ALL	P	SUR	643	2	0	1.6	-2.3	2.8
44763	50.7	-42.1	ALL	P	SUR	423	4	1	2.0	0.3	2.0
44765	58.8	-45.9	ALL	P	SUR	892	3	0	2.2	-0.6	2.2
44766	50.6	-28.7	ALL	P	SUR	927	7	1	1.9	0.2	1.9
44768	60.3	-15.4	ALL	P	SUR	1452	9	1	1.7	0.3	1.7
44771	55.1	-21.1	ALL	P	SUR	1202	3	0	1.6	0.1	1.6
44773	59.3	-25.2	ALL	P	SUR	1381	1	0	2.0	-0.2	2.0
44775	60.5	-25.8	ALL	P	SUR	1460	4	0	1.8	0.1	1.8
44780	55.4	-25.2	ALL	P	SUR	1238	6	0	2.0	-0.3	2.0
44834	53.4	-44.2	ALL	P	SUR	21	0	0	1.2	0.4	1.2
44901	54.1	-49.1	ALL	P	SUR	139	0	0	1.8	0.7	1.9
44911	59.9	-5.2	ALL	P	SUR	8	0	0	2.3	0.6	2.4
44912	51.8	-22.2	ALL	P	SUR	113	0	0	2.4	1.4	2.8
44925	59.9	-52.5	ALL	P	SUR	71	0	0	4.0	0.9	4.1
51633	34.9	-71.8	ALL	P	SUR	424	0	0	1.2	0.0	1.2
51634	23.8	-80.7	ALL	P	SUR	382	0	0	1.0	-0.3	1.0
61535	35.9	-4.4	ALL	P	SUR	448	0	0	1.1	0.1	1.1
61556	26.0	-83.0	ALL	P	SUR	374	0	0	1.0	0.1	1.0
61557	32.3	-76.0	ALL	P	SUR	370	0	0	1.1	0.1	1.1
62501	46.7	-14.3	ALL	P	SUR	21	0	0	1.1	1.3	1.7
62506	48.6	-15.6	ALL	P	SUR	56	0	0	0.9	1.2	1.5
62551	47.9	-16.2	ALL	P	SUR	588	0	0	1.0	0.5	1.1
62553	53.8	-18.7	ALL	P	SUR	727	2	0	1.6	0.3	1.6
62557	48.3	-11.1	ALL	P	SUR	1132	13	1	1.3	0.5	1.4
62558	55.1	-8.9	ALL	P	SUR	1216	5	0	1.5	0.9	1.7
62673	59.3	-23.0	ALL	P	SUR	452	0	0	1.8	-0.1	1.8
62674	59.0	-22.9	ALL	P	SUR	453	0	0	1.8	-0.2	1.8
62697	51.7	-11.4	ALL	P	SUR	826	8	1	1.4	0.4	1.5
62751	47.0	-19.2	ALL	P	SUR	195	0	0	1.6	0.2	1.7
62755	44.7	-16.8	ALL	P	SUR	151	0	0	1.2	0.5	1.3
62758	45.0	-19.0	ALL	P	SUR	183	0	0	1.1	0.2	1.1
62927	57.7	-7.2	ALL	P	SUR	3	0	0	1.5	0.0	1.5
62929	56.8	-34.1	ALL	P	SUR	12	0	0	1.4	0.1	1.4
64528	58.7	-22.7	ALL	P	SUR	1805	4	0	1.8	-0.5	1.9
64530	61.3	-52.0	ALL	P	SUR	1336	4	0	1.7	-0.2	1.7
64552	62.8	-31.5	ALL	P	SUR	1041	4	0	2.1	0.1	2.1
64561	54.6	-15.9	ALL	P	SUR	1058	12	1	1.5	0.2	1.5
64563	55.2	-36.9	ALL	P	SUR	1582	3	0	1.8	-0.7	1.9
65562	60.1	-17.1	ALL	P	SUR	1974	1	0	1.8	-0.6	1.9
65591	61.2	-28.5	ALL	P	SUR	988	7	1	1.8	-0.3	1.8

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
65592	61.6	-26.2	ALL	P	SUR	1483	17	1	2.5	-1.0	2.7
65594	62.1	-32.4	ALL	P	SUR	2126	3	0	1.9	-0.6	2.0
65597	53.0	-26.3	ALL	P	SUR	1339	6	0	1.8	-0.6	1.9
74532	44.4	-64.6	ALL	P	SUR	7	7	100	0.0	0.0	0.0
96762	40.5	-69.0	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
96764	40.4	-35.6	ALL	P	SUR	1	0	0	0.0	-1.9	1.9
WIND SPEED											
29803	36.1	-62.2	ALL	SPEED	SUR	11	0	0	6.3	2.1	6.7
41506	16.0	-61.0	ALL	SPEED	SUR	385	0	0	3.5	-5.5	6.5
41523	13.6	-56.1	ALL	SPEED	SUR	244	0	0	1.5	0.7	1.7
41524	15.6	-56.9	ALL	SPEED	SUR	259	0	0	1.8	0.5	1.9
41610	44.6	-12.5	ALL	SPEED	SUR	1	0	0	0.0	-1.9	1.9
42730029	54.0	-8.8	ALL	SPEED	SUR	18	0	0	3.7	-2.6	4.5
44609	55.5	-21.7	ALL	SPEED	SUR	948	3	0	4.5	-0.8	4.6
44621	58.1	-9.5	ALL	SPEED	SUR	598	1	0	3.3	-1.3	3.6
44624	61.4	-9.1	ALL	SPEED	SUR	995	3	0	3.0	-5.9	6.6
44762	39.3	-10.1	ALL	SPEED	SUR	134	0	0	3.4	-5.0	6.0
44768	60.3	-15.4	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
44773	59.3	-25.2	ALL	SPEED	SUR	1637	3	0	2.9	-1.9	3.4
62506	48.6	-15.6	ALL	SPEED	SUR	76	0	0	3.8	4.2	5.7
62551	47.9	-16.2	ALL	SPEED	SUR	413	1	0	2.2	1.0	2.4
62553	53.8	-18.7	ALL	SPEED	SUR	870	0	0	2.3	-0.7	2.4
62557	48.3	-11.1	ALL	SPEED	SUR	1	0	0	0.0	1.3	1.3
62558	55.1	-8.9	ALL	SPEED	SUR	5	0	0	10.5	3.3	11.0
62567	45.5	-12.2	ALL	SPEED	SUR	517	0	0	1.5	0.0	1.5
62673	59.3	-23.0	ALL	SPEED	SUR	530	0	0	2.3	-0.9	2.5
62674	59.0	-22.9	ALL	SPEED	SUR	504	0	0	2.5	-2.0	3.2
62697	51.7	-11.4	ALL	SPEED	SUR	494	0	0	3.8	-5.9	7.0
62751	47.0	-19.2	ALL	SPEED	SUR	729	0	0	1.7	0.4	1.8
62753	44.5	-17.8	ALL	SPEED	SUR	649	0	0	1.8	-0.1	1.8
62754	49.9	-16.3	ALL	SPEED	SUR	94	0	0	1.9	0.6	2.0
62755	44.7	-16.8	ALL	SPEED	SUR	548	0	0	2.5	-0.7	2.6
62756	44.4	-16.4	ALL	SPEED	SUR	592	0	0	2.3	-0.5	2.4
62757	45.4	-16.3	ALL	SPEED	SUR	664	0	0	2.7	-0.7	2.8
62758	45.0	-19.0	ALL	SPEED	SUR	731	0	0	1.7	-0.1	1.7
62759	44.2	-16.3	ALL	SPEED	SUR	645	0	0	1.5	0.3	1.6
62760	48.6	-15.7	ALL	SPEED	SUR	87	0	0	1.9	0.5	2.0
65562	60.1	-17.1	ALL	SPEED	SUR	1	0	0	0.0	13.0	13.0
65594	62.1	-32.4	ALL	SPEED	SUR	1	0	0	0.0	12.8	12.8
96762	40.5	-69.0	ALL	SPEED	SUR	1	0	0	0.0	1.0	1.0
96764	40.4	-35.6	ALL	SPEED	SUR	1	0	0	0.0	3.8	3.8
WIND DIRECTION											
29803	36.1	-62.2	ALL	DIRN.	SUR	5	0	0	50.5	45.9	68.2
41506	16.0	-61.0	ALL	DIRN.	SUR	2	0	0	19.8	-11.4	22.8
41523	13.6	-56.1	ALL	DIRN.	SUR	208	0	0	15.8	4.2	16.4
41524	15.6	-56.9	ALL	DIRN.	SUR	227	0	0	18.5	-14.0	23.2
41610	44.6	-12.5	ALL	DIRN.	SUR	1	0	0	0.0	7.3	7.3
42730029	54.0	-8.8	ALL	DIRN.	SUR	10	0	0	75.5	-33.2	82.5
44609	55.5	-21.7	ALL	DIRN.	SUR	650	3	0	22.1	-2.6	22.3
44621	58.1	-9.5	ALL	DIRN.	SUR	823	1	0	26.2	-9.5	27.8
44624	61.4	-9.1	ALL	DIRN.	SUR	430	3	1	18.2	0.9	18.2
44762	39.3	-10.1	ALL	DIRN.	SUR	13	0	0	82.6	-40.9	92.2
44773	59.3	-25.2	ALL	DIRN.	SUR	1100	3	0	23.9	-2.2	24.0
62506	48.6	-15.6	ALL	DIRN.	SUR	33	0	0	21.9	-13.4	25.7
62551	47.9	-16.2	ALL	DIRN.	SUR	271	1	0	23.3	-1.5	23.3
62553	53.8	-18.7	ALL	DIRN.	SUR	575	0	0	15.5	-0.1	15.5
62558	55.1	-8.9	ALL	DIRN.	SUR	1	0	0	0.0	179.7	179.7

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND DIRECTION											
62567	45.5	-12.2	ALL	DIRN.	SUR	438	0	0	11.5	1.7	11.7
62673	59.3	-23.0	ALL	DIRN.	SUR	375	0	0	15.5	-0.5	15.5
62674	59.0	-22.9	ALL	DIRN.	SUR	401	0	0	20.7	-4.2	21.1
62751	47.0	-19.2	ALL	DIRN.	SUR	392	0	0	13.8	-6.1	15.1
62753	44.5	-17.8	ALL	DIRN.	SUR	412	0	0	13.5	2.9	13.8
62754	49.9	-16.3	ALL	DIRN.	SUR	50	0	0	13.7	15.9	21.0
62755	44.7	-16.8	ALL	DIRN.	SUR	342	0	0	15.0	2.1	15.1
62756	44.4	-16.4	ALL	DIRN.	SUR	391	0	0	75.5	12.0	76.5
62757	45.4	-16.3	ALL	DIRN.	SUR	366	0	0	13.8	0.7	13.8
62758	45.0	-19.0	ALL	DIRN.	SUR	365	0	0	14.9	-8.3	17.0
62759	44.2	-16.3	ALL	DIRN.	SUR	456	0	0	38.4	-2.9	38.5
62760	48.6	-15.7	ALL	DIRN.	SUR	43	0	0	17.4	2.6	17.6
65594	62.1	-32.4	ALL	DIRN.	SUR	1	0	0	0.0	32.1	32.1
96762	40.5	-69.0	ALL	DIRN.	SUR	1	0	0	0.0	-11.5	11.5
96764	40.4	-35.6	ALL	DIRN.	SUR	1	0	0	0.0	-34.4	34.4

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from Bracknell global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB: US ACARs and ADS data are shown at the bottom of the table as US ACAR and ADS respectively.

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	3586	1	28	1.9	-0.2	5349	0	8	0	8.6	0.6
ACA	1150	1	15	1.9	-0.2	1984	0	4	0	7.4	0.5
AEA	195	2	26	2.8	0.5	335	0	12	0	10.5	1.4
AEL	420	0	7	1.8	-0.3	818	0	4	0	8.8	0.7
AEY	32	3	3	1.3	0.8	62	0	0	0	8.5	0.9
AFL	309	1	12	2.0	0.3	557	0	4	0	8.8	0.4
AFR	1209	1	15	1.7	0.1	2371	0	7	0	8.5	0.7
AIH	182	1	8	1.7	0.4	339	0	4	0	9.3	0.7
AJM	46	2	9	2.5	-0.9	93	0	4	0	11.8	0.6
AMX	184	1	5	1.8	-0.2	373	0	3	0	9.4	1.1
ANZ	193	0	5	2.1	-1.1	380	0	2	0	7.3	0.3
AOM	327	0	3	1.7	0.8	643	0	2	0	8.5	0.8
AUA	27	0	19	2.2	0.0	40	0	5	0	4.4	0.3
AVA	132	1	2	1.8	-0.2	265	0	4	0	13.0	1.1
AZA	380	1	31	2.0	-0.3	588	0	11	0	8.0	0.7
BAL	454	0	21	1.7	-0.5	882	0	11	0	7.8	0.5
BAW	1402	1	23	2.1	-0.2	2363	0	8	0	8.1	0.8
BBB	32	3	6	1.7	-0.9	57	0	2	0	8.3	1.1
BWA	102	1	10	2.4	1.2	190	0	3	0	7.5	0.9
CDN	491	0	8	1.9	0.7	931	0	2	0	8.4	0.8
CFC	29	0	14	2.4	-0.1	56	0	7	0	11.7	1.7
CFG	605	0	6	1.9	-0.9	1157	0	2	0	8.3	0.6
CKT	90	0	20	1.9	0.5	158	0	7	0	11.7	-0.1
CLX	259	0	8	2.0	-0.8	486	0	3	0	7.5	0.4
CMM	29	0	24	2.0	-0.4	48	0	10	0	9.1	0.4
COA	1046	1	28	1.8	0.0	1582	0	10	0	12.7	1.7
CRL	240	0	8	1.9	0.5	463	0	3	0	8.1	0.8
CTB	113	1	4	1.5	0.2	220	0	3	0	7.8	0.8
CUB	210	1	4	2.3	1.2	416	0	50	0	11.9	1.1
DAL	3033	1	31	2.0	-0.6	4363	0	10	0	9.0	0.5
DBY	87	0	1	1.4	-0.7	175	0	2	0	10.5	0.7
DHL	170	8	56	4.6	-2.9	251	0	14	0	11.9	0.9
DLH	2113	2	21	1.9	-0.1	3594	0	7	0	7.7	0.7
EIN	23	0	30	2.6	1.0	41	2	17	0	11.4	1.3
ELY	150	0	13	1.5	-0.4	290	0	6	0	7.7	1.1
EWW	81	2	12	2.5	1.0	153	0	6	0	11.5	0.8
FDX	141	1	17	1.9	0.3	235	0	4	0	9.0	1.0
FIN	307	0	17	2.0	0.4	499	0	3	0	7.2	0.5
GAF	49	4	22	2.0	0.8	85	0	6	0	8.2	0.2
HLF	75	0	12	1.8	-0.7	132	0	3	0	7.3	0.8
IBE	876	1	29	2.1	0.5	1572	0	13	0	10.5	0.8
ICE	621	1	33	2.0	-0.1	926	0	9	0	6.2	0.7
KLM	1838	1	14	1.8	-0.1	3307	0	5	0	8.0	0.6
LDA	163	1	28	1.8	-1.0	292	0	11	0	8.8	0.3
LDI	337	1	36	1.9	-0.2	572	0	15	0	8.0	0.4
LEI	181	1	14	1.7	0.1	330	0	5	0	9.4	0.5
LIB	138	0	6	1.9	1.0	274	0	3	0	9.0	0.4
LOT	167	1	17	2.3	-1.3	281	0	6	0	11.4	0.2
LTE	24	8	8	1.4	-0.9	52	0	6	0	7.0	1.5
LTU	600	0	24	1.9	-0.1	960	0	7	0	8.3	0.7
MON	46	2	17	1.8	0.2	80	0	8	0	10.5	1.0
MPD	78	0	9	2.1	1.0	148	1	6	0	9.3	0.5
MPH	561	1	11	1.9	-0.7	1043	0	4	0	8.3	0.5
NWA	2023	1	15	2.0	0.7	3531	0	4	0	8.7	0.5
PAC	66	2	26	2.4	0.3	109	0	9	0	9.3	1.1
RAM	55	0	5	1.9	-0.1	107	0	4	0	8.6	1.1
RCH	168	1	17	2.6	1.1	283	0	8	0	11.1	1.4
RJA	35	0	26	1.6	0.4	52	0	10	0	6.4	0.2
ROT	21	0	38	1.8	-1.4	36	0	14	0	6.5	0.9

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
RRR	74	0	27	2.3	-0.6	129	0	12	0	8.6	0.9
SAB	27	0	11	2.1	0.4	40	0	5	0	8.8	0.6
SAS	1025	0	1	1.8	-0.1	2040	0	1	0	7.7	0.5
SIA	102	0	4	1.9	-1.1	207	0	4	0	9.7	1.0
SLR	70	1	29	1.6	-0.2	143	0	13	0	7.2	0.2
SPP	140	0	25	2.0	-0.3	221	0	8	0	11.9	0.7
SVA	79	0	10	1.7	-0.4	158	0	51	0	10.4	0.7
SWR	176	1	24	1.5	0.2	283	0	9	0	9.8	0.8
TAP	295	0	6	1.7	-0.3	588	0	4	0	9.0	0.7
TOW	118	3	28	2.7	0.7	191	1	10	0	10.1	1.1
TPA	22	5	23	1.2	0.3	42	0	10	0	12.0	0.4
TWA	1299	0	32	2.0	-0.1	1799	0	10	0	8.9	0.7
UAL	1855	0	17	2.0	-0.3	3181	0	5	0	7.9	0.6
UNS	128	0	100	1.5	0.6	255	0	50	0	7.4	0.6
UPS	353	1	37	2.0	0.2	564	0	16	0	9.7	0.8
USA	261	0	27	1.6	-0.2	392	0	50	0	11.8	0.8
VIR	299	1	17	2.0	-0.6	508	0	5	0	8.8	1.2
BA	6757	0	1	1.5	0.4	13502	0	1	0	7.7	0.8
KL	2968	0	2	1.7	0.9	5922	0	1	0	7.2	0.7
LH	135	1	1	1.4	0.0	270	0	0	0	5.1	0.7
N	352	1	10	2.4	0.5	616	0	3	0	8.7	0.8
ADS	134	0	0	1.2	-0.1	268	0	0	0	5.3	0.5
US ACAR	12142	0	0	1.5	0.3	24276	0	0	0	7.3	0.7

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ARRAN	00	Z	100	7	0	20.1	29.8	-22.0
ARRAN	12	Z	100	8	0	13.3	21.8	-17.3
DBBH	00	Z	100	1	0	0.0	24.0	-24.0
DBLK	00	Z	100	1	0	0.0	28.0	-28.0
ELML7	00	Z	100	7	0	10.1	10.1	0.1
ELML7	12	Z	100	7	0	14.7	15.5	5.1
FATU	00	Z	100	1	0	0.0	24.0	24.0
FNCM	00	Z	100	11	0	13.8	27.1	23.4
FNCM	12	Z	100	13	0	10.2	14.6	10.5
FNOR	00	Z	100	10	0	21.8	23.0	7.2
FNOR	12	Z	100	11	0	18.5	20.8	9.5
FNOU	00	Z	100	7	0	15.2	17.4	8.3
FNOU	12	Z	100	8	0	9.9	14.9	11.1
FNPH	00	Z	100	14	0	19.1	19.1	-0.1
FNPH	12	Z	100	12	0	27.5	27.6	2.4
FNRS	00	Z	100	14	0	22.7	22.7	0.0
FNRS	12	Z	100	12	0	16.8	19.1	8.9
JNSR	00	Z	100	1	0	0.0	6.0	6.0
LDWR	00	Z	100	28	0	15.6	17.5	-7.8
LDWR	12	Z	100	27	0	12.5	12.5	-1.2
OVYA2	00	Z	100	16	0	63.7	68.1	-24.2
OVYA2	12	Z	100	18	0	22.1	24.7	10.9
OXTS2	00	Z	100	15	0	24.4	25.9	-8.5
OXTS2	12	Z	100	14	0	17.1	19.9	10.1
UCKZ	00	Z	100	1	0	0.0	43.0	43.0
V2VM	00	Z	100	16	0	14.6	18.2	-10.9
V2VM	12	Z	100	18	0	12.5	14.4	-7.2
V2VM856	00	Z	100	1	0	0.0	127.0	-127.0
V2XM	00	Z	100	10	0	18.6	18.8	-2.5
V2XM	12	Z	100	9	1	25.0	25.3	3.7
XXBA	00	Z	100	1	0	0.0	46.0	46.0
XXBA	12	Z	100	1	0	0.0	24.0	24.0
03953	00	Z	100	26	0	17.5	19.1	-7.6
03953	12	Z	100	29	0	9.5	14.5	-10.9
04018	00	Z	100	25	0	23.9	33.6	23.6
04018	12	Z	100	25	0	18.4	36.0	30.9
04220	00	Z	100	12	0	22.4	27.4	15.9
04220	12	Z	100	10	0	16.5	20.1	11.5
04270	00	Z	100	28	0	21.8	21.8	0.4
04270	12	Z	100	27	0	26.5	29.4	12.8
04339	00	Z	100	28	0	14.4	22.7	17.6
04339	12	Z	100	29	0	13.5	20.0	14.8
04360	00	Z	100	27	0	16.9	18.9	8.4
04360	12	Z	100	27	0	18.0	22.8	13.9
08001	00	Z	100	22	0	12.7	14.1	-6.1
08001	12	Z	100	25	1	13.0	15.4	-8.1
08508	00	Z	100	1	0	0.0	6.0	6.0
08508	12	Z	100	14	0	19.1	19.2	-1.6
08522	00	Z	100	1	0	0.0	16.0	16.0
08522	12	Z	100	22	0	18.0	18.5	4.2
60020	00	Z	100	27	0	4.2	4.3	-0.7
60020	12	Z	100	26	0	0.0	0.0	0.0
71600	00	Z	100	27	0	15.5	28.1	23.4
71600	12	Z	100	30	0	10.4	19.3	16.3
72201	00	Z	100	25	0	13.2	13.9	-4.5
72201	12	Z	100	28	0	15.9	16.5	-4.6
72402	00	Z	100	26	0	18.5	20.7	9.4
72402	12	Z	100	28	0	22.2	31.2	21.8
74494	00	Z	100	24	0	20.4	21.2	-6.0
74494	12	Z	100	28	0	51.5	58.5	27.7
78016	12	Z	100	28	0	16.4	17.4	5.8

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ARRAN	00	Z	500	12	0	35.0	41.1	-21.6
ARRAN	12	Z	500	13	0	18.4	23.1	-14.0
CGDX	00	Z	500	1	0	0.0	9.0	9.0
DBBH	00	Z	500	1	0	0.0	12.0	12.0
DBLK	00	Z	500	1	0	0.0	40.0	-40.0
ELML7	00	Z	500	8	0	13.9	15.5	7.0
ELML7	12	Z	500	7	0	14.3	22.6	17.4
FATU	00	Z	500	1	0	0.0	4.0	4.0
FNCM	00	Z	500	12	0	6.8	13.3	11.4
FNCM	12	Z	500	14	0	8.3	8.3	0.6
FNOR	00	Z	500	11	0	12.2	24.3	21.1
FNOR	12	Z	500	13	0	11.7	23.9	20.8
FNOU	00	Z	500	11	0	13.2	19.0	13.6
FNOU	12	Z	500	9	0	9.3	18.4	15.9
FNPH	00	Z	500	14	0	9.5	12.5	8.1
FNPH	12	Z	500	12	0	19.7	22.2	10.3
FNRS	00	Z	500	14	0	15.7	17.5	7.9
FNRS	12	Z	500	12	0	12.2	18.8	14.3
JNSR	00	Z	500	1	0	0.0	10.0	10.0
LDWR	00	Z	500	29	0	18.6	18.6	-0.6
LDWR	12	Z	500	27	0	12.8	12.9	1.6
OVYA2	00	Z	500	16	0	15.0	17.2	-8.4
OVYA2	12	Z	500	18	0	11.8	18.1	-13.7
OXTS2	00	Z	500	17	0	14.7	14.7	0.1
OXTS2	12	Z	500	15	0	16.7	17.2	4.1
UCKZ	00	Z	500	1	0	0.0	8.0	8.0
V2VM	00	Z	500	19	0	18.3	18.5	-2.6
V2VM	12	Z	500	19	0	13.5	13.5	-0.8
V2VM85600		Z	500	1	0	0.0	18.0	-18.0
V2XM	00	Z	500	11	0	14.1	14.2	-1.9
V2XM	12	Z	500	9	1	16.3	16.3	0.2
XXBA	00	Z	500	1	0	0.0	24.0	24.0
XXBA	12	Z	500	2	0	3.5	4.9	3.5
03953	00	Z	500	29	0	12.9	16.7	10.5
03953	12	Z	500	30	0	10.9	12.4	5.9
04018	00	Z	500	28	0	14.2	15.2	5.5
04018	12	Z	500	28	0	15.2	17.6	8.9
04220	00	Z	500	25	0	17.1	18.6	7.4
04220	12	Z	500	24	0	16.5	17.5	5.6
04270	00	Z	500	28	0	18.6	18.6	-1.0
04270	12	Z	500	30	0	12.1	13.2	-5.5
04339	00	Z	500	29	0	19.1	19.1	1.2
04339	12	Z	500	30	0	17.7	17.7	-0.6
04360	00	Z	500	28	0	16.8	17.1	-2.6
04360	12	Z	500	28	0	15.8	15.8	-0.2
08001	00	Z	500	29	0	10.7	16.8	13.0
08001	12	Z	500	29	0	24.4	24.4	1.9
08508	00	Z	500	1	0	0.0	3.0	3.0
08508	12	Z	500	19	0	18.4	24.5	16.2
08522	00	Z	500	1	0	0.0	21.0	21.0
08522	12	Z	500	22	0	10.3	20.5	17.7
60020	00	Z	500	27	0	15.4	19.0	11.2
60020	12	Z	500	26	0	11.5	14.3	8.5
71600	00	Z	500	28	0	15.8	18.1	8.8
71600	12	Z	500	30	0	13.0	16.0	9.3
72201	00	Z	500	27	0	6.4	10.5	8.3
72201	12	Z	500	29	0	8.4	8.4	0.9
72402	00	Z	500	26	0	17.3	18.7	-7.2
72402	12	Z	500	29	0	10.9	11.0	-1.6
74494	00	Z	500	28	0	14.8	14.8	1.5
74494	12	Z	500	29	0	13.8	14.0	2.1
78016	12	Z	500	28	0	13.0	18.2	12.7

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from Bracknell global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in $m\ s^{-1}$
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ARRAN	00	V	100	7	0	14	0.0	-0.2	2.8
ARRAN	12	V	100	7	0	0	0.0	-1.8	-1.6
DBLK	00	V	100	1	0	0	5.9	1.7	-1.7
ELML7	00	V	100	4	0	0	5.9	0.1	1.9
ELML7	12	V	100	7	0	14	5.9	-0.8	2.7
FATU	00	V	100	1	0	0	5.9	-3.8	-0.4
FNCM	00	V	100	10	0	0	5.9	1.7	2.8
FNCM	12	V	100	12	0	0	2.8	1.4	0.9
FNOR	00	V	100	5	0	0	3.8	-2.5	-2.4
FNOR	12	V	100	11	0	9	3.8	1.8	-2.1
FNOU	00	V	100	6	0	0	7.9	1.1	-1.0
FNOU	12	V	100	6	0	0	7.9	1.0	-1.8
FNPH	00	V	100	11	0	0	7.9	-1.0	-0.9
FNPH	12	V	100	12	0	0	5.8	-1.6	0.6
FNRS	00	V	100	13	0	0	5.5	0.3	-0.4
FNRS	12	V	100	11	0	9	5.8	-0.6	-0.6
JNSR	00	V	100	1	0	0	4.7	2.5	-2.8
LDWR	00	V	100	27	0	0	4.7	0.0	-1.0
LDWR	12	V	100	27	0	0	2.7	-0.3	-1.0
OVYA2	00	V	100	15	0	0	3.7	0.4	-0.1
OVYA2	12	V	100	18	0	0	4.6	-0.4	-0.5
OXTS2	00	V	100	13	0	0	3.6	-0.9	0.1
OXTS2	12	V	100	12	0	0	2.9	-0.5	-1.3
V2VM	00	V	100	13	0	0	2.3	-1.4	0.3
V2VM	12	V	100	16	0	0	3.5	0.8	1.2
V2XM	00	V	100	7	0	0	3.1	-2.1	-1.5
V2XM	12	V	100	7	0	0	3.1	-0.7	1.5
03953	00	V	100	26	0	0	1.8	-1.0	0.2
03953	12	V	100	29	0	0	3.4	-0.8	1.8
04018	00	V	100	21	0	4	2.9	-2.8	-0.4
04018	12	V	100	16	0	0	6.9	-0.9	1.0
04220	00	V	100	7	0	0	6.7	0.5	-0.1
04220	12	V	100	9	0	0	6.7	-1.0	-0.9
04270	00	V	100	22	0	0	6.7	0.5	0.9
04270	12	V	100	20	0	0	3.8	-1.1	-0.8
04339	00	V	100	21	0	4	2.6	-2.0	0.6
04339	12	V	100	29	0	0	4.4	0.9	0.3
04360	00	V	100	22	0	0	4.0	-0.2	-1.1
04360	12	V	100	17	0	0	3.0	-0.2	-0.1
08001	00	V	100	22	0	0	4.1	1.1	1.2
08001	12	V	100	25	0	0	3.7	-0.7	-0.2
08508	00	V	100	1	0	0	2.8	-5.1	-1.1
08508	12	V	100	11	0	0	2.8	0.5	0.5
60020	00	V	100	23	0	0	6.7	-2.0	-0.6
60020	12	V	100	23	0	0	4.5	-3.0	1.7
71600	00	V	100	27	0	0	2.9	0.3	0.4
71600	12	V	100	30	0	0	3.4	-0.6	0.2
72201	00	V	100	22	0	0	2.0	1.5	0.4
72201	12	V	100	25	0	0	4.8	-1.6	0.7
72402	00	V	100	25	0	0	2.5	-1.2	1.3
72402	12	V	100	28	0	0	3.7	-0.4	1.5
74494	00	V	100	23	0	0	4.2	-1.4	1.7
74494	12	V	100	26	0	0	2.8	-1.0	1.4
78016	12	V	100	28	0	0	6.6	-0.4	0.4

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: March, 1998

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from selected radiosonde TEMPs.

Area monitored :0°N - 90°N, 100°W - 40°E

Standard of comparison :Background field from Bracknell global model.

Position :Average latitude and longitude for period.

Observation times :00, 12 UTC.

Level monitored :500 hPa.

Element monitored :VECTOR WIND in $m\ s^{-1}$

Parameters monitored
- :NUM OBS :Number of observations available at level shown during period.
- :NUM GROSS :Number of gross errors at level shown during period.
- :UBIAS,VBIAS: Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
- :RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ARRAN	00	V	500	12	0	8	0.0	0.2	4.0
ARRAN	12	V	500	13	0	0	4.3	-1.3	-0.8
CGDX	00	V	500	1	0	0	4.1	-0.9	0.2
ELML7	00	V	500	6	0	0	4.0	1.5	-1.0
ELML7	12	V	500	7	0	0	4.0	1.3	1.9
FATU	00	V	500	1	0	0	4.0	-2.3	1.3
FNCM	00	V	500	10	0	0	4.0	0.5	0.7
FNCM	12	V	500	13	0	0	2.4	-0.5	-1.2
FNOR	00	V	500	9	0	0	2.9	-1.4	1.4
FNOR	12	V	500	12	0	8	2.9	-1.4	-0.2
FNOU	00	V	500	10	0	20	4.1	-0.5	-0.3
FNOU	12	V	500	9	0	0	5.6	0.6	-0.4
FNPH	00	V	500	14	0	0	5.6	-1.0	1.8
FNPH	12	V	500	12	0	0	3.9	-1.5	-0.1
FNRS	00	V	500	13	0	0	2.0	0.0	0.3
FNRS	12	V	500	12	0	16	3.4	-1.6	-0.9
JNSR	00	V	500	1	0	0	2.4	-2.3	0.7
LDWR	00	V	500	29	0	0	2.4	2.0	-1.3
LDWR	12	V	500	27	0	0	5.2	0.6	1.3
OVYA2	00	V	500	16	0	0	4.3	-0.3	-0.7
OVYA2	12	V	500	17	0	0	2.8	-0.8	-0.1
OXTS2	00	V	500	16	0	6	3.9	3.3	1.1
OXTS2	12	V	500	15	0	0	6.4	-0.3	-2.5
V2VM	00	V	500	18	0	0	3.5	-0.7	-1.1
V2VM	12	V	500	17	0	0	3.9	-0.6	-0.2
V2VM856	00	V	500	1	0	0	4.2	1.0	6.7
V2XM	00	V	500	7	0	0	4.2	0.9	0.1
V2XM	12	V	500	7	0	0	4.2	1.4	2.8
03953	00	V	500	29	0	0	3.9	0.4	-2.1
03953	12	V	500	30	0	0	3.8	-0.2	0.5
04018	00	V	500	21	0	4	3.2	-3.7	0.2
04018	12	V	500	25	0	12	5.4	-1.5	-1.7
04220	00	V	500	18	0	5	5.5	1.5	-0.8
04220	12	V	500	20	0	0	4.3	1.4	-1.1
04270	00	V	500	24	0	0	4.3	0.8	-1.2
04270	12	V	500	24	0	0	4.3	0.4	1.3
04339	00	V	500	21	0	4	4.5	-0.4	-2.0
04339	12	V	500	30	0	0	5.4	-1.8	1.1
04360	00	V	500	26	0	0	6.2	-0.9	-0.8
04360	12	V	500	24	0	0	4.3	-0.3	-0.7
08001	00	V	500	28	0	0	4.9	0.1	-1.4
08001	12	V	500	29	0	0	3.5	0.4	-1.6
08508	00	V	500	1	0	0	3.2	1.1	1.3
08508	12	V	500	16	0	0	3.2	1.3	1.1
60020	00	V	500	25	0	0	3.1	-2.3	1.5
60020	12	V	500	26	0	0	3.9	-2.5	-0.7
71600	00	V	500	28	0	0	3.0	1.9	0.4
71600	12	V	500	30	0	0	5.1	1.3	2.0
72201	00	V	500	27	0	0	3.4	-0.5	0.0
72201	12	V	500	29	0	0	4.5	-0.9	1.6
72402	00	V	500	26	0	3	2.4	0.7	0.5
72402	12	V	500	29	0	0	4.5	-0.1	0.9
74494	00	V	500	28	0	0	4.4	0.0	0.2
74494	12	V	500	29	0	0	2.7	0.2	1.1
78016	12	V	500	28	0	0	4.5	0.3	1.3

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45